

Remedial Action Report

Willow Brook and Willow Brook Pond
United Technologies Corporation
Pratt & Whitney
East Hartford, CT

RCRA RECORDS CENTER
FACILITY Pratt & Whitney - Main St
I.D. NO. CTD 990672081
FILE LOC. R-12
OTHER RDM S #1084

November 2002
Volume 4 of 5
Appendices D to E

PREPARED FOR:

UNITED TECHNOLOGIES CORP.
One Financial Plaza
Hartford, CT 06101

PREPARED BY:



Loureiro Engineering Associates, Inc.
100 Northwest Drive
Plainville, Connecticut 06062

An Employee Owned Company

Comm. No. 88UT002

RCRA RECORDS CENTER
FACILITY _____
I.D. NO. _____
FILE LOC. _____
OTHER _____

Appendix D

Lower Willow Brook Pond and Process Water Facility Confirmatory Analytical Results and Data Validation Reports

The following reports are partial reports and do not include the referenced tables confirmatory analytical results as indicated. This information will be provided under separate cover upon request.





Loureiro Engineering Associates, Inc.

To: Brian Cutler / LEA
From: Tina Clemmey / LEA
DV Report Date: 06/20/02

Project Name: Willow Brook Pond PCB Remediation
Sampled Date: 06/13/02

A Tier II data validation was performed on data for five wipe samples on June 13, 2002 for the Willow Brook Willow Pond PCB Remediation Project at Pratt & Whitney in East Hartford, Connecticut. The samples were collected from locations of the Site designated as WT-CS-11-079 through WT-CS-11-082. The sample was analyzed for PCBs by USEPA SW846 Method 8082. Samples were also submitted for "other" parameters. Validation of these parameters is discussed in a separate validation report.

The samples were submitted to Premier Laboratory, LLC in Brooklyn, CT. Premier processed and reported these samples under Project 88UT002-103. The internal laboratory lot number associated with this sample delivery group is E206656 (batch 15722).

The sample results were assessed according to Region 1, EPA Data Validation Functional Guidelines for Evaluating Environmental Analyses: Pesticides / PCBs, July 1988. Additional guidance and logic was obtained from the Functional Guidelines for Volatile / Semivolatile Data Validation Functional Guidelines, December 1996 when applicable. Technical judgement was also applied where applicable

The following tables have been included in this report: Table 1: Tier II Data Assessment, Table 2: Samples associated with the sample delivery group (SDG), Table 3: Summary of Data Validation Qualifiers applied to samples as a result of the validation, Table 4: Summary of Qualified Analytical Results.

An explanation of the validation decisions is presented below.

SAMPLES

Samples included in this review are listed in Table 2 of this report.

PCB ANALYSES

Performance Evaluation Data

Data for performance evaluation samples (PEs) are generated to provide information on the overall accuracy and bias of the analytical method and on laboratory performance. The PE is evaluated to assess the magnitude and direction of the quantitative bias. The frequency for performance evaluation samples for this project is one per twenty field samples.

A double blind aqueous performance evaluation sample (2002513) was submitted with this data set. The PE sample was prepared by Environmental Resource Associates (ERA). The ERA lot number associated with this sample was 0612-02-01.1 Aroclor 1254 was spiked into the sample at a concentration of 3.56 ug/l. The performance acceptance limit was 1.74 - 4.84 ug/l. The laboratory reported a concentration of 5.9 ug/l. QC acceptance criteria were met. Performance data is presented in Attachment 1 of this report.

Preservation and technical holding times

The validity of the analytical results is evaluated based on the preservation techniques used and the holding time of the sample, as appropriate.

The samples were extracted and analyzed within acceptable holding time. The sample temperature upon receipt was 8°C which was slightly above the acceptance limit of 4°C +/- 2°C. No qualification was applied based on sample temperature.

Agreement with the Chain of Custody

Five wipe samples were shipped to Premier Laboratory under chain of custody on 06/14/02. The samples were analyzed for PCBs by SW846 Method 8082. No discrepancies were noted.

Initial Calibration and Continuing Calibration

Compliance requirements for initial and continuing calibrations are evaluated to ensure that the instruments are capable of producing acceptable qualitative and quantitative data.

Initial calibration curves were performed on GC4. Equal concentrations of a mixture of Aroclors 1016 and 1260 were used. Calibration factors were calculated at five concentrations. All percent relative standard deviations (%RSD) were less than 20%.

Continuing calibration verifications were performed on GC4. Each continuing calibration standard consisted of a mixture of Aroclors 1016 and 1260 and was performed at a single concentration. The percent drift (%D) was less than 15%. QC acceptance criteria were met for the continuing calibration.

Blanks

Blank analyses data is to determine the existence and magnitude of contamination problems resulting from laboratory and / or field activities and to subsequently assess their contribution to measurement error

No detects were reported in the method blank.

Surrogate Compounds

Sample matrix effects and laboratory performance on individual samples are assessed by evaluating surrogate recovery. Poor surrogate recovery can be an indication of Interfering matrix effects, presence of high concentration target and/or non-target analytes, and poor laboratory performance.

Surrogates tetrachloro-m-xylene and decachlorobiphenyl were spiked into every sample. QC acceptance criteria were met for percent recovery (%R) for both surrogates in all of the field samples, QC samples and blanks analyzed for PCBs.

Matrix Spike / Matrix Spike Duplicate Analyses

Data for matrix spike / matrix spike duplicates were evaluated to determine laboratory precision and method bias for specific sample matrices.

A matrix spike / matrix spike duplicate was not performed for wipe samples.

Laboratory Control Sample

Laboratory control samples are evaluated to assess the internal quality control of the laboratory's analytical method accuracy and method bias.

All QC acceptance criteria were met for percent recovery (%R) for the LCS samples.

Field Duplicate

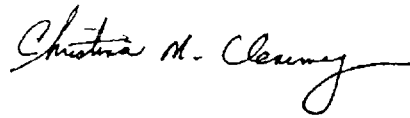
Samples 2002511 and 2002512 were submitted as a field duplicate pair. The results were reported as 1700 ng/cm² and ND<400 ng/cm². The results were estimated (J) based on poor field duplicate precision since one result was greater than two times the detection limit and one result was non-detect.

OVERALL EVALUATION OF THE DATA

The objective of the final evaluation of this data package is to identify the “analytical error” and any “sampling error” associated with the data. The sum of the “analytical error” and the “sampling error” equals the “measurement error.” The end user should use the “measurement error” in conjunction with sampling variability to determine “total error” (total uncertainty) associated with the data. Ultimately, the end user should assess data usability in the context of the pre-determined Data Quality Objectives (DQOs) and resultant “total error” of the data.

Data were qualified based on poor field duplicate precision.

To the best of my knowledge, after thorough review of the attached sampling data and validation information, I believe that the data does show that the Performance Standards identified in the Remedial Action Work Plan have been met.

A handwritten signature in black ink, reading "Christina M. Cleary". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

Authorized Pratt & Whitney Representative



Loureiro Engineering Associates, Inc.

To: Brian Cutler / LEA
From: Tina Clemmey / LEA
DV Report Date: 06/20/02

Project Name: Willow Brook Pond PCB Remediation
Sampled Date: 06/13/02

A Tier II data validation was performed on data for four wipe samples on June 13, 2002 for the Willow Brook Willow Pond PCB Remediation Project at Pratt & Whitney in East Hartford, Connecticut. The samples were collected from locations of the Site designated as WT-CS-11-083 through WT-CS-11-086. The sample was analyzed for PCBs by USEPA SW846 Method 8082. Samples were also submitted for "other" parameters. Validation of these parameters is discussed in a separate validation report.

The samples were submitted to Premier Laboratory, LLC in Brooklyn, CT. Premier processed and reported these samples under Project 88UT002-103. The internal laboratory lot number associated with this sample delivery group is E206651 (batch 15722).

The sample results were assessed according to Region 1, EPA Data Validation Functional Guidelines for Evaluating Environmental Analyses: Pesticides / PCBs, July 1988. Additional guidance and logic was obtained from the Functional Guidelines for Volatile / Semivolatile Data Validation Functional Guidelines, December 1996 when applicable. Technical judgement was also applied where applicable

The following tables have been included in this report: Table 1: Tier II Data Assessment, Table 2: Samples associated with the sample delivery group (SDG), Table 3: Summary of Data Validation Qualifiers applied to samples as a result of the validation, Table 4: Summary of Qualified Analytical Results.

An explanation of the validation decisions is presented below.

SAMPLES

Samples included in this review are listed in Table 2 of this report.

PCB ANALYSES

Performance Evaluation Data

Data for performance evaluation samples (PEs) are generated to provide information on the overall accuracy and bias of the analytical method and on laboratory performance. The PE is evaluated to assess the magnitude and direction of the quantitative bias. The frequency for performance evaluation samples for this project is one per twenty field samples.

A double blind aqueous performance evaluation sample (2002518) was submitted with this data set. The PE sample was prepared by Environmental Resource Associates (ERA). The ERA lot number associated with this sample was 0612-02-01.2 Aroclor 1254 was spiked into the sample at a concentration of 5.90 ug/l. The performance acceptance limit was 2.89 - 8.02 ug/l. The laboratory reported a concentration of 5.9 ug/l. QC acceptance criteria were met. Performance data is presented in Attachment 1 of this report.

Preservation and technical holding times

The validity of the analytical results is evaluated based on the preservation techniques used and the holding time of the sample, as appropriate.

The samples were extracted and analyzed within acceptable holding time. The sample temperature upon receipt was 7°C which was slightly above the acceptance limit of 4°C +/- 2°C. No qualification was applied based on sample temperature.

Agreement with the Chain of Custody

Four wipe samples were shipped to Premier Laboratory under chain of custody on 06/14/02. The samples were analyzed for PCBs by SW846 Method 8082. No discrepancies were noted.

Initial Calibration and Continuing Calibration

Compliance requirements for initial and continuing calibrations are evaluated to ensure that the instruments are capable of producing acceptable qualitative and quantitative data.

Initial calibration curves were performed on GC4. Equal concentrations of a mixture of Aroclors 1016 and 1260 were used. Calibration factors were calculated at five concentrations. All percent relative standard deviations (%RSD) were less than 20%.

Continuing calibration verifications were performed on GC4. Each continuing calibration standard consisted of a mixture of Aroclors 1016 and 1260 and was performed at a single concentration. The percent drift (%D) was less than 15%. QC acceptance criteria were met for the continuing calibration.

Blanks

Blank analyses data is to determine the existence and magnitude of contamination problems resulting from laboratory and / or field activities and to subsequently assess their contribution to measurement error

No detects were reported in the method blank.

Surrogate Compounds

Sample matrix effects and laboratory performance on individual samples are assessed by evaluating surrogate recovery. Poor surrogate recovery can be an indication of Interfering matrix effects, presence of high concentration target and/or non-target analytes, and poor laboratory performance.

Surrogates tetrachloro-m-xylene and decachlorobiphenyl were spiked into every sample. QC acceptance criteria were met for percent recovery (%R) for both surrogates in all of the field samples, QC samples and blanks analyzed for PCBs.

Matrix Spike / Matrix Spike Duplicate Analyses

Data for matrix spike / matrix spike duplicates were evaluated to determine laboratory precision and method bias for specific sample matrices.

A matrix spike / matrix spike duplicate was not performed for wipe samples.

Laboratory Control Sample

Laboratory control samples are evaluated to assess the internal quality control of the laboratory's analytical method accuracy and method bias.

All QC acceptance criteria were met for percent recovery (%R) for the LCS samples.

Field Duplicate

No field duplicates were submitted with this data set.

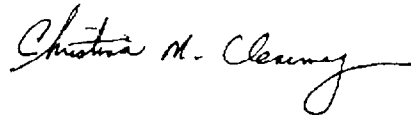
OVERALL EVALUATION OF THE DATA

The objective of the final evaluation of this data package is to identify the “analytical

error” and any “sampling error” associated with the data. The sum of the “analytical error” and the “sampling error” equals the “measurement error.” The end user should use the “measurement error” in conjunction with sampling variability to determine “total error” (total uncertainty) associated with the data. Ultimately, the end user should assess data usability in the context of the pre-determined Data Quality Objectives (DQOs) and resultant “total error” of the data.

No data were qualified.

To the best of my knowledge, after thorough review of the attached sampling data and validation information, I believe that the data does show that the Performance Standards identified in the Remedial Action Work Plan have been met.

A handwritten signature in black ink, reading "Christina M. Cleary". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

Authorized Pratt & Whitney Representative



Loureiro Engineering Associates, Inc.

To: Brian Cutler / LEA
From: Tina Clemmey / LEA
DV Report Date: 06/24/02

Project Name: Willow Brook Pond PCB Remediation
Sampled Date: 06/13/02

A Tier II data validation was performed on data for one soil sample on June 13, 2002 for the Willow Brook Willow Pond PCB Remediation Project at Pratt & Whitney in East Hartford, Connecticut. The samples were collected from locations of the Site designated as WT-CS-10-016. The sample was analyzed for PCBs by USEPA SW846 Method 8082. Samples were also submitted for “other” parameters. Validation of these parameters is discussed in a separate validation report.

The samples were submitted to Premier Laboratory, LLC in Brooklyn, CT. Premier processed and reported these samples under Project 88UT002-103. The internal laboratory lot number associated with this sample delivery group is E206645 (batch 15722).

The sample results were assessed according to Region 1, EPA Data Validation Functional Guidelines for Evaluating Environmental Analyses: Pesticides / PCBs, July 1988. Additional guidance and logic was obtained from the Functional Guidelines for Volatile / Semivolatile Data Validation Functional Guidelines, December 1996 when applicable. Technical judgement was also applied where applicable

The following tables have been included in this report: Table 1: Tier II Data Assessment, Table 2: Samples associated with the sample delivery group (SDG), Table 3: Summary of Data Validation Qualifiers applied to samples as a result of the validation, Table 4: Summary of Qualified Analytical Results.

An explanation of the validation decisions is presented below.

SAMPLES

Samples included in this review are listed in Table 2 of this report.

PCB ANALYSES

Performance Evaluation Data

Data for performance evaluation samples (PEs) are generated to provide information on the overall accuracy and bias of the analytical method and on laboratory performance. The PE is evaluated to assess the magnitude and direction of the quantitative bias. The frequency for performance evaluation samples for this project is one per twenty field samples.

A double blind aqueous performance evaluation sample (2002520) was submitted with this data set. The PE sample was prepared by Environmental Resource Associates (ERA). The ERA lot number associated with this sample was 0612-02-01.3 Aroclor 1254 was spiked into the sample at a concentration of 8.47 ug/l. The performance acceptance limit was 4.15 - 11.5 ug/l. The laboratory reported a concentration of 8.1 ug/l. QC acceptance criteria were met. Performance data is presented in Attachment 1 of this report.

Preservation and technical holding times

The validity of the analytical results is evaluated based on the preservation techniques used and the holding time of the sample, as appropriate.

The samples were extracted and analyzed within acceptable holding time. The sample temperature upon receipt was 8°C which was slightly above the acceptance limit of 4°C +/- 2°C. No qualification was applied based on sample temperature.

Agreement with the Chain of Custody

One soil sample was shipped to Premier Laboratory under chain of custody on 06/14/02. The samples were analyzed for PCBs by SW846 Method 8082. No discrepancies were noted.

Initial Calibration and Continuing Calibration

Compliance requirements for initial and continuing calibrations are evaluated to ensure that the instruments are capable of producing acceptable qualitative and quantitative data.

Initial calibration curves were performed on GC4. Equal concentrations of a mixture of Aroclors 1016 and 1260 were used. Calibration factors were calculated at five concentrations. All percent relative standard deviations (%RSD) were less than 20%.

Continuing calibration verifications were performed on GC4. Each continuing calibration standard consisted of a mixture of Aroclors 1016 and 1260 and was performed at a single concentration. The percent drift (%D) was less than 15%. QC acceptance criteria were met for the continuing calibration.

Blanks

Blank analyses data is to determine the existence and magnitude of contamination problems resulting from laboratory and / or field activities and to subsequently assess their contribution to measurement error

No detects were reported in the method blank.

Surrogate Compounds

Sample matrix effects and laboratory performance on individual samples are assessed by evaluating surrogate recovery. Poor surrogate recovery can be an indication of Interfering matrix effects, presence of high concentration target and/or non-target analytes, and poor laboratory performance.

Surrogates tetrachloro-m-xylene and decachlorobiphenyl were spiked into every sample. QC acceptance criteria were met for percent recovery (%R) for both surrogates in all of the field samples, QC samples and blanks analyzed for PCBs.

Matrix Spike / Matrix Spike Duplicate Analyses

Data for matrix spike / matrix spike duplicates were evaluated to determine laboratory precision and method bias for specific sample matrices.

A matrix spike / matrix spike duplicate was performed for soil sample 2002519. All QC acceptance criteria were met.

Laboratory Control Sample

Laboratory control samples are evaluated to assess the internal quality control of the laboratory's analytical method accuracy and method bias.

All QC acceptance criteria were met for percent recovery (%R) for the LCS samples.

Field Duplicate

A field duplicate pair was not submitted with this data set.

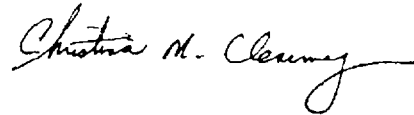
OVERALL EVALUATION OF THE DATA

The objective of the final evaluation of this data package is to identify the “analytical

error” and any “sampling error” associated with the data. The sum of the “analytical error” and the “sampling error” equals the “measurement error.” The end user should use the “measurement error” in conjunction with sampling variability to determine “total error” (total uncertainty) associated with the data. Ultimately, the end user should assess data usability in the context of the pre-determined Data Quality Objectives (DQOs) and resultant “total error” of the data.

All data were accepted as reported.

To the best of my knowledge, after thorough review of the attached sampling data and validation information, I believe that the data does show that the Performance Standards identified in the Remedial Action Work Plan have been met.

A handwritten signature in black ink, reading "Christina M. Cleary". The signature is written in a cursive style with a long horizontal flourish at the end.

Authorized Pratt & Whitney Representative



Loureiro Engineering Associates, Inc.

To: Brian Cutler / LEA
From: Tina Clemmey / LEA
DV Report Date: 06/13/02

Project Name: Willow Brook Pond PCB Remediation
Sampled Date: 06/10/02

A Tier II data validation was performed on data for two concrete chip samples, one equipment blank and a performance sample collected on June 10, 2002 for the Willow Brook Willow Pond PCB Remediation Project at Pratt & Whitney in East Hartford, Connecticut. The samples were collected from locations of the Site designated as WT-CS-07-034 through WT-CS-07-034. The sample was analyzed for PCBs by USEPA SW846 Method 8082. Samples were also submitted for "other" parameters. Validation of these parameters is discussed in a separate validation report.

The samples were submitted to Premier Laboratory, LLC in Brooklyn, CT. Premier processed and reported these samples under Project 88UT002-103. The internal laboratory lot number associated with this sample delivery group is E206410 (batch 15658).

The sample results were assessed according to Region 1, EPA Data Validation Functional Guidelines for Evaluating Environmental Analyses: Pesticides / PCBs, July 1988. Additional guidance and logic was obtained from the Functional Guidelines for Volatile / Semivolatile Data Validation Functional Guidelines, December 1996 when applicable. Technical judgement was also applied where applicable

The following tables have been included in this report: Table 1: Tier II Data Assessment, Table 2: Samples associated with the sample delivery group (SDG), Table 3: Summary of Data Validation Qualifiers applied to samples as a result of the validation, Table 4: Summary of Qualified Analytical Results.

An explanation of the validation decisions is presented below.

SAMPLES

Samples included in this review are listed in Table 2 of this report.

PCB ANALYSES

Performance Evaluation Data

Data for performance evaluation samples (PEs) are generated to provide information on the overall accuracy and bias of the analytical method and on laboratory performance. The PE is evaluated to assess the magnitude and direction of the quantitative bias. The frequency for performance evaluation samples for this project is one per twenty field samples.

A double blind aqueous performance evaluation (PE) sample was submitted with this data set as sample 2002506. The PE sample was prepared by Environmental Resource Associates (ERA) in Arvada, Colorado. The ERA lot number for the PE sample was 0528-02-03.6. The certified value for Aroclor 1254 was 2.24 ug/l. The acceptance range was 1.10 – 3.05 ug/l. The laboratory reported 2.4 ug/l.

Preservation and technical holding times

The validity of the analytical results is evaluated based on the preservation techniques used and the holding time of the sample, as appropriate.

The samples were extracted and analyzed within acceptable holding time. The sample temperatures upon receipt were 9°C. The acceptance limit for temperature is 4°C +/- 2°C. No qualification was applied based on concrete sample temperature for PCBs since the samples were collected at ambient temperature, place on ice in a cooler and shipped directly to the laboratory. The trip from the Site to the laboratory was generally completed in less than one hour.

Agreement with the Chain of Custody

Four soil samples were shipped to Premier Laboratory under chain of custody on 06/10/02. The samples were analyzed for PCBs by SW846 Method 8082. Validation of PCBs is discussed in this report. Validation of the “other” parameters is discussed in a separate validation report. No discrepancies were noted.

Initial Calibration and Continuing Calibration

Compliance requirements for initial and continuing calibrations are evaluated to ensure that the instruments are capable of producing acceptable qualitative and quantitative data.

Initial calibration curves were performed on GC4. Equal concentrations of a mixture of Aroclors 1016 and 1260 were used. Calibration factors were calculated at five concentrations. All percent relative standard deviations (%RSD) were less than 20%.

Continuing calibration verifications were performed on GC4. Each continuing calibration standard consisted of a mixture of Aroclors 1016 and 1260 and was performed at a single concentration. The percent drift (%D) was less than 15%. QC acceptance criteria were met for the continuing calibration.

Blanks

Blank analyses data is to determine the existence and magnitude of contamination problems resulting from laboratory and / or field activities and to subsequently assess their contribution to measurement error

No detects were reported in the method blank or in the equipment blank (2002504).

Surrogate Compounds

Sample matrix effects and laboratory performance on individual samples are assessed by evaluating surrogate recovery. Poor surrogate recovery can be an indication of Interfering matrix effects, presence of high concentration target and/or non-target analytes, and poor laboratory performance.

Surrogates tetrachloro-m-xylene and decachlorobiphenyl were spiked into every sample. QC acceptance criteria were met for percent recovery (%R) for both surrogates in all of the field samples, QC samples and blanks analyzed for PCBs.

Matrix Spike / Matrix Spike Duplicate Analyses

Data for matrix spike / matrix spike duplicates were evaluated to determine laboratory precision and method bias for specific sample matrices.

A matrix spike / matrix spike duplicate was performed on sample 2002502 with this data set. Percent recovery and relative percent difference were within acceptance limits. All data were accepted as reported in the unspiked sample.

Laboratory Control Sample

Laboratory control samples are evaluated to assess the internal quality control of the laboratory's analytical method accuracy and method bias.

All QC acceptance criteria were met for percent recovery (%R) for the LCS samples.

Field Duplicate

Samples 2002502 and 2002503 were submitted as a field duplicate pair with this data

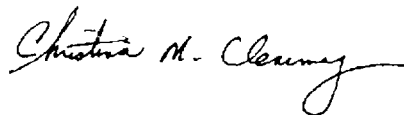
set. All Aroclor results were reported as ND<120 ug/kg in both samples.

OVERALL EVALUATION OF THE DATA

The objective of the final evaluation of this data package is to identify the “analytical error” and any “sampling error” associated with the data. The sum of the “analytical error” and the “sampling error” equals the “measurement error.” The end user should use the “measurement error” in conjunction with sampling variability to determine “total error” (total uncertainty) associated with the data. Ultimately, the end user should assess data usability in the context of the pre-determined Data Quality Objectives (DQOs) and resultant “total error” of the data.

No data were qualified.

To the best of my knowledge, after thorough review of the attached sampling data and validation information, I believe that the data does show that the Performance Standards identified in the Remedial Action Work Plan have been met.

A handwritten signature in black ink, reading "Christina M. Cleary". The signature is fluid and cursive, with a long horizontal stroke at the end.

Authorized Pratt & Whitney Representative



Loureiro Engineering Associates, Inc.

To: Brian Cutler / LEA
From: Tina Clemmey / LEA
DV Report Date: 07/31/02

Project Name: Willow Brook Pond PCB Remediation
Sampled Date: 06/10/02

A Tier II data validation was performed on data for one concrete chip sample (2002507) collected on June 10, 2002 for the Willow Brook Willow Pond PCB Remediation Project at Pratt & Whitney in East Hartford, Connecticut. The samples discussed in this validation memorandum were analyzed for VOCs by SW846 Method 8260B, SVOCs by SW846 Method 8270C, TPH by USEPA 418.1, Metals by SW846 Method 6010B and Cyanide by SW846 Method 9012. These parameters are herein referred to as the "other parameters." Validation for the samples submitted for PCBs by SW846 Method 8082 are presented in a separate validation report.

The samples were submitted to Premier Laboratory, LLC in Brooklyn, CT. Premier processed and reported these samples under Project 88UT103. The internal laboratory lot number associated with this sample delivery group is E206410.

The sample results were assessed according to Region 1, EPA Data Validation Functional Guidelines for Evaluating Environmental Analyses: Organic Data Review (December 1996), Pesticides / PCBs Data Review (July 1988) and Inorganic Data Review (February 1989) as appropriate. Chemistry parameters were validated using the same logic as presented in Region 1, EPA validation guidelines for other parameters where applicable. Since there is no official guidance at this time for validating general chemistry analyses. Technical judgement was applied when

applicable and necessary.

The following tables have been included in this report: Table I: Summary of Tier II Data Assessment, Table II Samples associated with the sample delivery group (SDG), Table III: Summary of Data Validation Qualifiers applied to samples as a result of the validation, and Table IV: Summary of Qualified Analytical Results.

An explanation of the validation decisions is presented below.

SAMPLES

Samples included in this review are listed in Table II of this report.

ORGANIC DATA REVIEW

Organic data review includes review of analyses for volatile organic compounds (VOCs) and semivolatile organic compounds (SVOCs).

REVIEW OF ELEMENTS

Sample data were reviewed for the following parameters:

- | | |
|--------------------------------------|---|
| ▪ Performance Evaluation Sample Data | ▪ Surrogate Compounds |
| ▪ Agreement with Chain-of-Custody | ▪ Internal Standards |
| ▪ Preservation and Holding Time | ▪ Matrix Spike / Matrix Spike Duplicate |
| ▪ GC/MS Instrument Performance Check | ▪ Laboratory Control Sample |

- Initial and Continuing Calibration
- Practical Quantitation Limits
- Blanks
- Tentatively Identified compounds

DISCUSSION

Agreement of Analyses with Chain of Custody

Sample reports are checked to verify that the reported results corresponded to analytical requests as detailed on the chain-of-custody record. The chain-of-custody form is reviewed for accuracy and completeness.

Samples were collected on June 10, 2002. The samples were shipped and received by Premier Laboratory, LLC under chain-of-custody on June 11, 2002. During validation, the chain-of-custody form was reviewed for accuracy and completeness. No discrepancies were noted.

VOLATILE ORGANIC ANALYSES

Performance Evaluation Data

Data for performance evaluation samples (PEs) are generated to provide information on the overall accuracy and bias of the analytical method and on laboratory performance. The PE is evaluated to assess the magnitude and direction of the quantitative bias.

A double blind aqueous performance evaluation sample was not submitted with this data set.

Preservation and technical holding times

The validity of the analytical results is evaluated based on the preservation techniques used and the holding time of the sample, as appropriate.

The sample cooler temperature recorded by the laboratory was 9.0°C for the concrete chip sample. All samples were extracted and analyzed within method specified holding times.

GC/MS Instrument Performance Check

Gas chromatograph / mass spectrometer (GC/MS) instrument performance (tuning) checks are evaluated to ensure proper mass calibration and resolution, identification and to some degree sensitivity.

All ion abundance acceptance criteria specified in the methods for VOCs were met for each 12-hour period that samples were analyzed.

Initial and Continuing Calibration

Compliance requirements for initial and continuing calibrations are evaluated to ensure that the instruments are capable of producing acceptable qualitative and quantitative data.

All VOC target compounds were within the QC acceptance criteria for the initial and calibration. There was a high % drift reported for acetone in the continuing calibration. The acetone result was estimated in sample 2002507.

Blanks

Blank analyses data is to determine the existence and magnitude of contamination problems resulting from laboratory and / or field activities and

to subsequently assess their contribution to measurement error

The method blank was evaluated for contamination for VOCs. No detects were reported.

Surrogate Compounds

Sample matrix effects and laboratory performance on individual samples are assessed by evaluating surrogate recovery. Poor surrogate recovery can be an indication of Interfering matrix effects, presence of high concentration target and/or non-target analytes, and poor laboratory performance.

Low percent recovery was reported for the surrogate dibromofluoromethane in samples 2002507, 2002507 MS and 2002507 MSD. No detects were reported in the sample. It should also be noted that the MS/MSD spike recoveries performed on this sample were also low which suggests the presence of matrix interference. The LCS was within acceptance limits. All results for sample 2002507 were estimated based on low surrogate recovery.

Internal Standards

Instrument performance, stability and laboratory precision are evaluated by assessing internal standard area count recovery and retention time drift.

All VOC data for the QC acceptance criteria were met for internal standard (IS) area counts and retention times.

Matrix Spike / Matrix Spike Duplicate Analyses

Data for matrix spike / matrix spike duplicates were evaluated to determine laboratory precision and method bias for specific sample matrices.

The laboratory performed a VOC matrix spike / matrix spike duplicate (MS/MSD) analyses on LEA sample 2002507. Spike recoveries were high for bromomethane and trichloroethene and low for 1,1,2,2-tetrachloroethylene. Surrogates were also low in the MS/MSD samples due to matrix interference. All results were previously estimated for sample 2002507 based on low surrogate recovery in the unspiked sample. The 1,1,2,2-tetrachloroethylene result in sample 2002507 was rejected because the spike recovery was reported as 0% in the MS/MSD.

Laboratory Control Sample

Laboratory control samples are evaluated to assess the internal quality control of the laboratory's analytical method accuracy and method bias.

All data met the QC acceptance criteria for percent recovery for the VOC laboratory control sample(s) which indicates that the laboratory was operating in control and that there is matrix interference in sample 2002507 and the corresponding MS/MSD samples.

Field Duplicate

A field duplicate pair was submitted as samples 2002478 and 2002479. There were no detects in either sample.

Tentatively Identified Compounds

No tentatively identified compounds were reported.

SEMIVOLATILE ORGANIC ANALYSES

Performance Evaluation Data

Data for performance evaluation samples (PEs) are generated to provide

information on the overall accuracy and bias of the analytical method and on laboratory performance. The PE is evaluated to assess the magnitude and direction of the quantitative bias.

A double blind aqueous performance evaluation sample was not submitted with this data set.

Preservation and technical holding times

The validity of the analytical results is evaluated based on the preservation techniques used and the holding time of the sample, as appropriate.

The sample cooler temperature recorded by the laboratory was 9°C. All samples were extracted and analyzed within method specified holding times.

GC/MS Instrument Performance Check

Gas chromatograph / mass spectrometer (GC/MS) instrument performance (tuning) checks are evaluated to ensure proper mass calibration and resolution, identification and to some degree sensitivity.

All ion abundance acceptance criteria specified in the methods SVOCs were met for each 12-hour period that samples were analyzed.

Initial and Continuing Calibration

Compliance requirements for initial and continuing calibrations are evaluated to ensure that the instruments are capable of producing acceptable qualitative and quantitative data.

All SVOC target compounds were within the QC acceptance criteria for the initial and continuing calibrations.

Blanks

Blank analyses data is to determine the existence and magnitude of contamination problems resulting from laboratory and / or field activities and to subsequently assess their contribution to measurement error

The method blank was evaluated for contamination for SVOCs. No detects were reported.

Surrogate Compounds

Sample matrix effects and laboratory performance on individual samples are assessed by evaluating surrogate recovery. Poor surrogate recovery can be an indication of Interfering matrix effects, presence of high concentration target and/or non-target analytes, and poor laboratory performance.

Surrogates 2,4,6-tribromophenol and 2-fluorophenol were below the QC acceptance limit for surrogate recovery for samples 2002507, 2002507MS and 2002507MSD. There were no detects in the unspiked sample. All acid fraction results (NDs) were rejected.

Internal Standards

Instrument performance, stability and laboratory precision are evaluated by assessing internal standard area count recovery and retention time drift.

All SVOC data for the QC acceptance criteria were met for internal standard (IS) area counts and retention times.

Matrix Spike / Matrix Spike Duplicate Analyses

Data for matrix spike / matrix spike duplicates were evaluated to determine

laboratory precision and method bias for specific sample matrices.

The laboratory performed an SVOC matrix spike / matrix spike duplicate (MS/MSD) analyses on LEA sample 2002507. Several SVOC compound recoveries for the MS/MSD were outside of the established control limits. Results for the affected compounds were rejected. Details of qualification decisions are presented in Table III.

Laboratory Control Sample

Laboratory control samples are evaluated to assess the internal quality control of the laboratory's analytical method accuracy and method bias.

All data met the QC acceptance criteria for percent recovery for the SVOC laboratory control samples.

Field Duplicate

A field duplicate was not submitted with this data set.

Tentatively Identified Compounds

No tentatively identified compounds were reported.

INORGANIC DATA REVIEW

REVIEW OF ELEMENTS

Sample data were reviewed for the following parameters:

- | | |
|--------------------------------------|-------------------------|
| ▪ Performance Evaluation Data | ▪ Matrix Spike |
| ▪ Agreement with Chain of Custody | ▪ Field Duplicates |
| ▪ Preservation and Technical Holding | ▪ Laboratory Duplicates |

Times

- Calibration Verification
- Blanks
- ICP Interference Check Sample
- Furnace AA / Post Digestion Spike
- Laboratory Control Sample
- Serial Dilution Results
- Detection Limit Results

DISCUSSION

Performance Evaluation Data

Data for performance evaluation samples (PEs) are generated to provide information on the overall accuracy and bias of the analytical method and on laboratory performance. The PE is evaluated to assess the magnitude and direction of the quantitative bias.

A double blind aqueous performance evaluation sample was not submitted with this data set.

Preservation and Holding Times

All samples were properly preserved and analyzed within method-specified holding times.

Calibration Verification

Compliance requirements are evaluated to ensure that the instrument is capable of producing acceptable quantitative data.

All initial calibration verification (ICV) and continuing calibration verification (CCV) for all metals were analyzed at the appropriate frequency and were within control limits

Blanks

Blank analyses were assessed to determine the existence and magnitude of contamination problems.

All analytes were within acceptance limit for percent recovery for the lab fortified blank analysis. No detects were reported in the method blank.

Matrix Spike / Matrix Spike Duplicate

The matrix spike sample was evaluated to provide information about the effect of the sample matrix on the digestion and measurement methodology.

A MS/MSD was performed on sample 2002507. All results were within acceptance limits.

Laboratory Duplicates

All analytes were within acceptance limits for Relative Percent Difference for the laboratory duplicate analyses. Criteria for acceptable duplicate precision is less than 35% RPD for sample results that are greater than five times the CRDL and +/- 2X CRDL for sample results that are less than the five times the CRDL.

Field Duplicates

Field duplicates were assessed to determine overall precision (i.e. field and laboratory precision).

A field duplicate pair was not submitted with this data set.

Laboratory Control Sample

The laboratory control sample is evaluated to assess the efficiency of the digestion procedure.

All data were within the QC acceptance criteria for LCS percent recovery (%R) for for all elements with the exception of lead. Lead was reported with a high percent recovery. The lead result was estimated in sample 2002507 and the reported result may be biased high.

ICP Interference Check Sample

All results were within QC acceptance limits for % recovery for the ICP Interference Check sample.

GENERAL CHEMISTRY DATA REVIEW

General Chemistry data review includes review of analyses for Total Petroleum Hydrocarbons (TPH) and Cyanide. There are currently no Region 1 functional guidelines for data validation of general chemistry parameters. Therefore, general chemistry data are evaluated based upon the QC requirements specified in the method by which they were analyzed.

REVIEW OF ELEMENTS

Sample data were reviewed for the following parameters:

- | | |
|--------------------------------------|-----------------------------|
| ▪ Performance Evaluation Sample Data | ▪ Matrix Spike |
| ▪ Agreement with Chain of Custody | ▪ Field Duplicates |
| ▪ Preservation and Holding Time | ▪ Laboratory Duplicates |
| ▪ Initial Calibration Verification | ▪ Laboratory Control Sample |

- Continuing Calibration Verification
- Detection Limit Results
- Blanks

DISCUSSION

Performance Evaluation Data

Data for performance evaluation samples (PEs) are generated to provide information on the overall accuracy and bias of the analytical method and on laboratory performance. The PE is evaluated to assess the magnitude and direction of the quantitative bias.

A double blind aqueous performance evaluation sample was not submitted with this data set.

Preservation and Holding Times

All samples analyzed for TPH and cyanide were extracted within method-specified holding times.

Initial Calibration Verification

The initial calibrations were analyzed at the appropriate frequency. The correlation coefficient for the initial calibration curve for TPH was greater than 0.9950. The %RSD was less than 20%.

All initial calibration QC acceptance criteria were met for Cyanide.

Continuing Calibration Verification

The continuing calibrations were analyzed at the appropriate frequency. The %D was

below 15% for the continuing calibration analyses for TPH. All QC acceptance criteria were met for continuing calibrations for cyanide.

Blanks

No detects were reported in the associated method blanks for TPH and cyanide. All QC acceptance criteria for the blanks were acceptable

Matrix Spike

The MS / MSD was performed on sample 2002507. All QC acceptance criteria were met.

Field Duplicate

A field duplicate pair was not submitted with this data set.

Laboratory Duplicate

Laboratory precision was demonstrated through laboratory duplicate analysis. All sample duplicate results were within QC acceptance limits for duplicate RPD.

Laboratory Control Sample

All QC acceptance criteria were met for LCS for TPH and cyanide.

OVERALL EVALUATION OF THE DATA

The objective of the final evaluation of this data package is to identify the “analytical error” and any “sampling error” associated with the data. The sum of the “analytical error” and the “sampling error” equals the “measurement error.” The end user should use the “measurement error” in conjunction with sampling variability to determine

“total error” (total uncertainty) associated with the data. The data in this data package have been qualified as rejected (R) or estimated (J) depending upon the degree of analytical and / or sampling error. Ultimately, the end user should assess data usability in the context of the pre-determined Data Quality Objectives (DQOs) and resultant “total error” of the data.

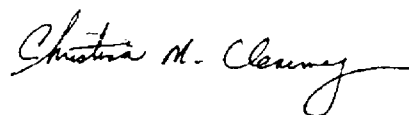
All VOC data were estimated based on low surrogate recovery. Acetone was also estimated based on high % drift in the continuing calibration. Bromomethane and trichloroethylene were reported with a high recovery in the MS/MSD. These results were previously qualified based on surrogate recovery. The VOC compound 1,1,2,2-tetrachloroethylene was rejected based on low MS/MSD spike recovery.

All SVOC acid fraction data were rejected based on low surrogate recovery and low MS/MSD spike recovery.

Lead was estimated (bias high) based on high LCS recovery.

No qualifiers were applied to TPH and cyanide results.

To the best of my knowledge, after thorough review of the attached sampling data and validation information, I believe that the data does show that the Performance Standards identified in Remedial Action Work Plan have been met.

A handwritten signature in black ink, reading "Christina M. Cleary". The signature is written in a cursive style with a long, sweeping underline.

Authorized Pratt & Whitney Representative



Loureiro Engineering Associates, Inc.

To: Brian Cutler / LEA
From: Tina Clemmey / LEA
DV Report Date: 06/13/02

Project Name: Willow Brook Pond PCB Remediation
Sampled Date: 06/10/02

A Tier II data validation was performed on data for four soil samples on June 10, 2002 for the Willow Brook Willow Pond PCB Remediation Project at Pratt & Whitney in East Hartford, Connecticut. The samples were collected from locations of the Site designated as WT-CS-07-030 through WT-CS-07-033. The sample was analyzed for PCBs by USEPA SW846 Method 8082. Samples were also submitted for "other" parameters. Validation of these parameters is discussed in a separate validation report.

The samples were submitted to Premier Laboratory, LLC in Brooklyn, CT. Premier processed and reported these samples under Project 88UT002-103. The internal laboratory lot number associated with this sample delivery group is E206406 (batch 15658).

The sample results were assessed according to Region 1, EPA Data Validation Functional Guidelines for Evaluating Environmental Analyses: Pesticides / PCBs, July 1988. Additional guidance and logic was obtained from the Functional Guidelines for Volatile / Semivolatile Data Validation Functional Guidelines, December 1996 when applicable. Technical judgement was also applied where applicable

The following tables have been included in this report: Table 1: Tier II Data Assessment, Table 2: Samples associated with the sample delivery group (SDG), Table 3: Summary of Data Validation Qualifiers applied to samples as a result of the validation, Table 4: Summary of Qualified Analytical Results.

An explanation of the validation decisions is presented below.

SAMPLES

Samples included in this review are listed in Table 2 of this report.

PCB ANALYSES

Performance Evaluation Data

Data for performance evaluation samples (PEs) are generated to provide information on the overall accuracy and bias of the analytical method and on laboratory performance. The PE is evaluated to assess the magnitude and direction of the quantitative bias. The frequency for performance evaluation samples for this project is one per twenty field samples.

A double blind aqueous performance evaluation sample was not submitted with this data set.

Preservation and technical holding times

The validity of the analytical results is evaluated based on the preservation techniques used and the holding time of the sample, as appropriate.

The samples were extracted and analyzed within acceptable holding time. The sample temperatures upon receipt were 8°C. The acceptance limit for temperature is 4°C +/- 2°C. No qualification was applied based on soil sample temperature for PCBs since the samples were collected at ambient temperature, place on ice in a cooler and

shipped directly to the laboratory. The trip from the Site to the laboratory was generally completed in less than one hour.

Agreement with the Chain of Custody

Four soil samples were shipped to Premier Laboratory under chain of custody on 06/10/02. The samples were analyzed for PCBs by SW846 Method 8082. Validation of PCBs is discussed in this report. Validation of the “other” parameters is discussed in a separate validation report. No discrepancies were noted.

Initial Calibration and Continuing Calibration

Compliance requirements for initial and continuing calibrations are evaluated to ensure that the instruments are capable of producing acceptable qualitative and quantitative data.

Initial calibration curves were performed on GC4. Equal concentrations of a mixture of Aroclors 1016 and 1260 were used. Calibration factors were calculated at five concentrations. All percent relative standard deviations (%RSD) were less than 20%.

Continuing calibration verifications were performed on GC4. Each continuing calibration standard consisted of a mixture of Aroclors 1016 and 1260 and was performed at a single concentration. The percent drift (%D) was less than 15%. QC acceptance criteria were met for the continuing calibration.

Blanks

Blank analyses data is to determine the existence and magnitude of contamination problems resulting from laboratory and / or field activities and to subsequently assess their contribution to measurement error

No detects were reported in the method blank.

Surrogate Compounds

Sample matrix effects and laboratory performance on individual samples are assessed by evaluating surrogate recovery. Poor surrogate recovery can be an indication of Interfering matrix effects, presence of high concentration target and/or non-target analytes, and poor laboratory performance.

Surrogates tetrachloro-m-xylene and decachlorobiphenyl were spiked into every sample. QC acceptance criteria were met for percent recovery (%R) for both surrogates in all of the field samples, QC samples and blanks analyzed for PCBs.

Matrix Spike / Matrix Spike Duplicate Analyses

Data for matrix spike / matrix spike duplicates were evaluated to determine laboratory precision and method bias for specific sample matrices.

A matrix spike / matrix spike duplicate was performed on sample 2002498 with this data set. Percent recovery and relative percent difference were within acceptance limits. All data were accepted as reported in the unspiked sample.

Laboratory Control Sample

Laboratory control samples are evaluated to assess the internal quality control of the laboratory's analytical method accuracy and method bias.

All QC acceptance criteria were met for percent recovery (%R) for the LCS samples.

Field Duplicate

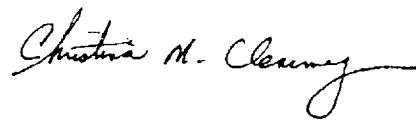
No field duplicates were submitted with this data set.

OVERALL EVALUATION OF THE DATA

The objective of the final evaluation of this data package is to identify the “analytical error” and any “sampling error” associated with the data. The sum of the “analytical error” and the “sampling error” equals the “measurement error.” The end user should use the “measurement error” in conjunction with sampling variability to determine “total error” (total uncertainty) associated with the data. Ultimately, the end user should assess data usability in the context of the pre-determined Data Quality Objectives (DQOs) and resultant “total error” of the data.

No data were qualified.

To the best of my knowledge, after thorough review of the attached sampling data and validation information, I believe that the data does show that the Performance Standards identified in the Remedial Action Work Plan have been met.

A handwritten signature in black ink, reading "Christina M. Cleary". The signature is fluid and cursive, with a long horizontal stroke at the end.

Authorized Pratt & Whitney Representative



Loureiro Engineering Associates, Inc.

To: Brian Cutler / LEA
From: Tina Clemmey / LEA
DV Report Date: 08/08/02

Project Name: Willow Brook Pond PCB Remediation
Sampled Date: 06/10/02

A Tier II data validation was performed on data for four soil samples collected on June 10, 2002 for the Willow Brook Willow Pond PCB Remediation Project at Pratt & Whitney in East Hartford, Connecticut. The samples discussed in this validation memorandum were analyzed for VOCs by SW846 Method 8260B, SVOCs by SW846 Method 8270C, TPH by USEPA 418.1, Metals by SW846 Method 6010B and Cyanide by SW846 Method 9012. These parameters are herein referred to as the "other parameters." Validation for the samples submitted for PCBs by SW846 Method 8082 are presented in a separate validation report.

The samples were submitted to Premier Laboratory, LLC in Brooklyn, CT. Premier processed and reported these samples under Project 88UT103. The internal laboratory lot number associated with this sample delivery group is E206406.

The sample results were assessed according to Region 1, EPA Data Validation Functional Guidelines for Evaluating Environmental Analyses: Organic Data Review (December 1996), Pesticides / PCBs Data Review (July 1988) and Inorganic Data Review (February 1989) as appropriate. Chemistry parameters were validated using the same logic as presented in Region 1, EPA validation guidelines for other parameters where applicable. Since there is no official guidance at this time for validating general chemistry analyses. Technical judgement was applied when

applicable and necessary.

The following tables have been included in this report: Table I: Summary of Tier II Data Assessment, Table II Samples associated with the sample delivery group (SDG), Table III: Summary of Data Validation Qualifiers applied to samples as a result of the validation, and Table IV: Summary of Qualified Analytical Results.

An explanation of the validation decisions is presented below.

SAMPLES

Samples included in this review are listed in Table II of this report.

ORGANIC DATA REVIEW

Organic data review includes review of analyses for volatile organic compounds (VOCs) and semivolatile organic compounds (SVOCs).

REVIEW OF ELEMENTS

Sample data were reviewed for the following parameters:

- Performance Evaluation Sample Data
- Surrogate Compounds
- Agreement with Chain-of-Custody
- Internal Standards
- Preservation and Holding Time
- Matrix Spike / Matrix Spike Duplicate
- GC/MS Instrument Performance Check
- Laboratory Control Sample

- Initial and Continuing Calibration
- Practical Quantitation Limits
- Blanks
- Tentatively Identified compounds

DISCUSSION

Agreement of Analyses with Chain of Custody

Sample reports are checked to verify that the reported results corresponded to analytical requests as detailed on the chain-of-custody record. The chain-of-custody form is reviewed for accuracy and completeness.

Samples were collected on June 10, 2002. The samples were received by Premier Laboratory, LLC under chain-of-custody on June 11, 2002. During validation, the chain-of-custody form was reviewed for accuracy and completeness. No discrepancies were noted.

VOLATILE ORGANIC ANALYSES

Performance Evaluation Data

Data for performance evaluation samples (PEs) are generated to provide information on the overall accuracy and bias of the analytical method and on laboratory performance. The PE is evaluated to assess the magnitude and direction of the quantitative bias.

A double blind aqueous performance evaluation sample was not submitted with this data set.

Preservation and technical holding times

The validity of the analytical results is evaluated based on the preservation techniques used and the holding time of the sample, as appropriate.

The sample cooler temperature recorded by the laboratory was 8.0°C. All samples were extracted and analyzed within method specified holding times.

GC/MS Instrument Performance Check

Gas chromatograph / mass spectrometer (GC/MS) instrument performance (tuning) checks are evaluated to ensure proper mass calibration and resolution, identification and to some degree sensitivity.

All ion abundance acceptance criteria specified in the methods for VOCs were met for each 12-hour period that samples were analyzed.

Initial and Continuing Calibration

Compliance requirements for initial and continuing calibrations are evaluated to ensure that the instruments are capable of producing acceptable qualitative and quantitative data.

All VOC target compounds were within the QC acceptance criteria for the initial and calibration.

Blanks

Blank analyses data is to determine the existence and magnitude of contamination problems resulting from laboratory and / or field activities and to subsequently assess their contribution to measurement error

The method blank was evaluated for contamination for VOCs. No detects were reported. No detects were reported in the trip blank (2002505).

Surrogate Compounds

Sample matrix effects and laboratory performance on individual samples are assessed by evaluating surrogate recovery. Poor surrogate recovery can be an indication of Interfering matrix effects, presence of high concentration target and/or non-target analytes, and poor laboratory performance.

All surrogates were within QC acceptance limits for percent recovery.

Internal Standards

Instrument performance, stability and laboratory precision are evaluated by assessing internal standard area count recovery and retention time drift.

All VOC data for the QC acceptance criteria were met for internal standard (IS) area counts and retention times.

Matrix Spike / Matrix Spike Duplicate Analyses

Data for matrix spike / matrix spike duplicates were evaluated to determine laboratory precision and method bias for specific sample matrices.

The laboratory performed a VOC matrix spike / matrix spike duplicate (MS/MSD) analyses on LEA sample 2002498. All QC acceptance criteria were met for percent recovery and relative percent difference.

Laboratory Control Sample

Laboratory control samples are evaluated to assess the internal quality control of the

laboratory's analytical method accuracy and method bias.

All data met the QC acceptance criteria for percent recovery for the VOC laboratory control sample.

Field Duplicate

A field duplicate pair was not submitted with this data set.

Tentatively Identified Compounds

No tentatively identified compounds were reported.

SEMIVOLATILE ORGANIC ANALYSES

Performance Evaluation Data

Data for performance evaluation samples (PEs) are generated to provide information on the overall accuracy and bias of the analytical method and on laboratory performance. The PE is evaluated to assess the magnitude and direction of the quantitative bias.

A double blind aqueous performance evaluation sample was not submitted with this data set.

Preservation and technical holding times

The validity of the analytical results is evaluated based on the preservation techniques used and the holding time of the sample, as appropriate.

The sample cooler temperature recorded by the laboratory was 8°C. All samples were extracted and analyzed within method specified holding times.

GC/MS Instrument Performance Check

Gas chromatograph / mass spectrometer (GC/MS) instrument performance (tuning) checks are evaluated to ensure proper mass calibration and resolution, identification and to some degree sensitivity.

All ion abundance acceptance criteria specified in the methods SVOCs were met for each 12-hour period that samples were analyzed.

Initial and Continuing Calibration

Compliance requirements for initial and continuing calibrations are evaluated to ensure that the instruments are capable of producing acceptable qualitative and quantitative data.

All SVOC target compounds were within the QC acceptance criteria for the initial and continuing calibrations.

Blanks

Blank analyses data is to determine the existence and magnitude of contamination problems resulting from laboratory and / or field activities and to subsequently assess their contribution to measurement error

The method blank was evaluated for contamination for SVOCs. No detects were reported.

Surrogate Compounds

Sample matrix effects and laboratory performance on individual samples are assessed by evaluating surrogate recovery. Poor surrogate recovery can be an indication of Interfering matrix effects, presence of high concentration target and/or non-target analytes, and poor laboratory performance.

All surrogates were within QC acceptance limits for percent recovery.

Internal Standards

Instrument performance, stability and laboratory precision are evaluated by assessing internal standard area count recovery and retention time drift.

All SVOC data for the QC acceptance criteria were met for internal standard (IS) area counts and retention times.

Matrix Spike / Matrix Spike Duplicate Analyses

Data for matrix spike / matrix spike duplicates were evaluated to determine laboratory precision and method bias for specific sample matrices.

The laboratory performed an SVOC matrix spike / matrix spike duplicate (MS/MSD) analyses on LEA sample 2002498. Several SVOC compound recoveries for the MS/MSD were outside of the established control limits. Results for the affected compounds were estimated. Details of qualification decisions are presented in Table III.

Laboratory Control Sample

Laboratory control samples are evaluated to assess the internal quality control of the laboratory's analytical method accuracy and method bias.

All data met the QC acceptance criteria for percent recovery for the SVOC laboratory control samples.

Field Duplicate

A field duplicate was not submitted with this data set.

Tentatively Identified Compounds

No tentatively identified compounds were reported.

INORGANIC DATA REVIEW

REVIEW OF ELEMENTS

Sample data were reviewed for the following parameters:

- | | |
|--|-------------------------------------|
| ▪ Performance Evaluation Data | ▪ Matrix Spike |
| ▪ Agreement with Chain of Custody | ▪ Field Duplicates |
| ▪ Preservation and Technical Holding Times | ▪ Laboratory Duplicates |
| | ▪ Furnace AA / Post Digestion Spike |
| ▪ Calibration Verification | ▪ Laboratory Control Sample |
| ▪ Blanks | ▪ Serial Dilution Results |
| ▪ ICP Interference Check Sample | ▪ Detection Limit Results |

DISCUSSION

Performance Evaluation Data

Data for performance evaluation samples (PEs) are generated to provide information on the overall accuracy and bias of the analytical method and on laboratory performance. The PE is evaluated to assess the magnitude and direction of the quantitative bias.

A double blind aqueous performance evaluation sample was not submitted with this data set.

Preservation and Holding Times

All samples were properly preserved and analyzed within method-specified holding times.

Calibration Verification

Compliance requirements are evaluated to ensure that the instrument is capable of producing acceptable quantitative data.

All initial calibration verification (ICV) and continuing calibration verification (CCV) for all metals were analyzed at the appropriate frequency and were within control limits

Blanks

Blank analyses were assessed to determine the existence and magnitude of contamination problems.

All analytes were within acceptance limit for percent recovery for the lab fortified blank analysis. No detects were reported in the method blank.

Matrix Spike / Matrix Spike Duplicate

The matrix spike sample was evaluated to provide information about the effect of the sample matrix on the digestion and measurement methodology.

A MS/MSD was performed on sample 2002498. Zinc was reported at 36% recovery for the MS and MSD analyses. The QC acceptance criteria is 75-125%. All zinc results in all samples in the data set are estimated

Laboratory Duplicates

All analytes were within acceptance limits for Relative Percent Difference for the

laboratory duplicate analyses. Criteria for acceptable duplicate precision is less than 35% RPD for sample results that are greater than five times the CRDL and +/- 2X CRDL for sample results that are less than the five times the CRDL.

Field Duplicates

Field duplicates were assessed to determine overall precision (i.e. field and laboratory precision).

A field duplicate pair was not submitted with this data set.

Laboratory Control Sample

The laboratory control sample is evaluated to assess the efficiency of the digestion procedure.

All data were within the QC acceptance criteria for LCS percent recovery (%R) for for all elements with the exception of lead and mercury. Both lead and mercury were reported with high percent recovery. All lead and mercury results were estimated and the reported result may be biased high.

ICP Interference Check Sample

All results were within QC acceptance limits for % recovery for the ICP Interference Check sample.

GENERAL CHEMISTRY DATA REVIEW

General Chemistry data review includes review of analyses for Total Petroleum Hydrocarbons (TPH) and Cyanide. There are currently no Region 1 functional guidelines for data validation of general chemistry parameters. Therefore, general chemistry data are evaluated based upon the QC requirements specified in the method

by which they were analyzed.

REVIEW OF ELEMENTS

Sample data were reviewed for the following parameters:

- Performance Evaluation Sample Data
- Agreement with Chain of Custody
- Preservation and Holding Time
- Initial Calibration Verification
- Continuing Calibration Verification
- Blanks
- Matrix Spike
- Field Duplicates
- Laboratory Duplicates
- Laboratory Control Sample
- Detection Limit Results

DISCUSSION

Performance Evaluation Data

Data for performance evaluation samples (PEs) are generated to provide information on the overall accuracy and bias of the analytical method and on laboratory performance. The PE is evaluated to assess the magnitude and direction of the quantitative bias.

A double blind aqueous performance evaluation sample was not submitted with this data set.

Preservation and Holding Times

All samples analyzed for TPH and cyanide were extracted within method-specified holding times.

Initial Calibration Verification

The initial calibrations were analyzed at the appropriate frequency. The correlation coefficient for the initial calibration curve for TPH was greater than 0.9950. The %RSD was less than 20%.

All initial calibration QC acceptance criteria were met for Cyanide.

Continuing Calibration Verification

The continuing calibrations were analyzed at the appropriate frequency. The %D was below 15% for the continuing calibration analyses for TPH. All QC acceptance criteria were met for continuing calibrations for cyanide.

Blanks

No detects were reported in the associated method blanks for TPH and cyanide. All QC acceptance criteria for the blanks were acceptable

Matrix Spike

The MS / MSD was performed on sample 2002498. All QC acceptance criteria were met.

Field Duplicate

A field duplicate pair was not submitted with this data set.

Laboratory Duplicate

Laboratory precision was demonstrated through laboratory duplicate analysis. All sample duplicate results were within QC acceptance limits for duplicate RPD.

Laboratory Control Sample

All QC acceptance criteria were met for LCS for TPH and cyanide.

OVERALL EVALUATION OF THE DATA

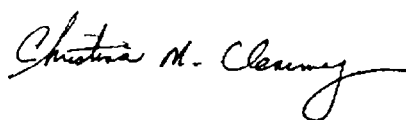
The objective of the final evaluation of this data package is to identify the “analytical error” and any “sampling error” associated with the data. The sum of the “analytical error” and the “sampling error” equals the “measurement error.” The end user should use the “measurement error” in conjunction with sampling variability to determine “total error” (total uncertainty) associated with the data. The data in this data package have been qualified as rejected (R) or estimated (J) depending upon the degree of analytical and / or sampling error. Ultimately, the end user should assess data usability in the context of the pre-determined Data Quality Objectives (DQOs) and resultant “total error” of the data.

Some SVOC data were estimated based on low MS/MSD spike recovery and or high relative percent difference.

Lead and mercury were estimated (bias high) based on high LCS recovery. Zinc was estimated based on low MS/MSD percent recovery.

No qualifiers were applied to VOC, TPH and cyanide results.

To the best of my knowledge, after thorough review of the attached sampling data and validation information, I believe that the data does show that the Performance Standards identified in Remedial Action Work Plan have been met.



Authorized Pratt & Whitney Representative



Loureiro Engineering Associates, Inc.

To: Brian Cutler / LEA
From: Tina Clemmey / LEA
DV Report Date: 06/10/02

Project Name: Willow Brook Pond PCB Remediation
Sampled Date: 06/03/02

A Tier II data validation was performed on data for one wipe sample collected on June 03, 2002 for the Willow Brook Willow Pond PCB Remediation Project at Pratt & Whitney in East Hartford, Connecticut. The samples was collected from a location of the Site designated as WT-CS-08-042. The sample was analyzed for PCBs by USEPA SW846 Method 8082.

The samples were submitted to Premier Laboratory, LLC in Brooklyn, CT. Premier processed and reported these samples under Project 88UT002-103. The internal laboratory lot number associated with this sample delivery group is E206022 (batch 15478).

The sample results were assessed according to Region 1, EPA Data Validation Functional Guidelines for Evaluating Environmental Analyses: Pesticides / PCBs, July 1988. Additional guidance and logic was obtained from the Functional Guidelines for Volatile / Semivolatile Data Validation Functional Guidelines, December 1996 when applicable. Technical judgement was also applied where applicable

The following tables have been included in this report: Table 1: Tier II Data

Assessment, Table 2: Samples associated with the sample delivery group (SDG), Table 3: Summary of Data Validation Qualifiers applied to samples as a result of the validation, Table 4: Summary of Qualified Analytical Results.

An explanation of the validation decisions is presented below.

SAMPLES

Samples included in this review are listed in Table 2 of this report.

PCB ANALYSES

Performance Evaluation Data

Data for performance evaluation samples (PEs) are generated to provide information on the overall accuracy and bias of the analytical method and on laboratory performance. The PE is evaluated to assess the magnitude and direction of the quantitative bias. The frequency for performance evaluation samples for this project is one per twenty field samples.

A double blind aqueous performance evaluation sample was not submitted with this data set.

Preservation and technical holding times

The validity of the analytical results is evaluated based on the preservation techniques used and the holding time of the sample, as appropriate.

The samples were extracted and analyzed within acceptable holding time. The sample temperature upon receipt was 9°C. The acceptance limit for temperature is 4°C +/- 2°C. No qualification was based on sample temperature since the samples were generally collected at ambient temperature, placed on ice in a cooler and almost immediately transferred to a courier for delivery to the laboratory. The trip from the

Site to the laboratory was generally completed in approximately one hour.

Agreement with the Chain of Custody

One wipe samples, a trip blank and six aqueous performance samples was shipped to Premier Laboratory under chain of custody on 06/03/02. The samples were analyzed for PCBs by SW846 Method 8082. No discrepancies were noted.

Initial Calibration and Continuing Calibration

Compliance requirements for initial and continuing calibrations are evaluated to ensure that the instruments are capable of producing acceptable qualitative and quantitative data.

Initial calibration curves were performed on GC4. Equal concentrations of a mixture of Aroclors 1016 and 1260 were used. Calibration factors were calculated at five concentrations. All percent relative standard deviations (%RSD) were less than 20%.

Continuing calibration verifications were performed on GC4. Each continuing calibration standard consisted of a mixture of Aroclors 1016 and 1260 and was performed at a single concentration. The percent drift (%D) was less than 15%. QC acceptance criteria were met for the continuing calibration.

Blanks

Blank analyses data is to determine the existence and magnitude of contamination problems resulting from laboratory and / or field activities and to subsequently assess their contribution to measurement error

No detects were reported in the method blank.

Surrogate Compounds

Sample matrix effects and laboratory performance on individual samples are assessed by evaluating surrogate recovery. Poor surrogate recovery can be

an indication of Interfering matrix effects, presence of high concentration target and/or non-target analytes, and poor laboratory performance.

Surrogates tetrachloro-m-xylene and decachlorobiphenyl were spiked into every sample. QC acceptance criteria were met for percent recovery (%R) for both surrogates in all of the field samples, QC samples and blanks analyzed for PCBs.

Matrix Spike / Matrix Spike Duplicate Analyses

Data for matrix spike / matrix spike duplicates were evaluated to determine laboratory precision and method bias for specific sample matrices.

A matrix spike / matrix spike duplicate was not performed for wipe samples.

Laboratory Control Sample

Laboratory control samples are evaluated to assess the internal quality control of the laboratory's analytical method accuracy and method bias.

All QC acceptance criteria were met for percent recovery (%R) for the LCS samples.

Field Duplicate

No field duplicates were submitted with this data set.

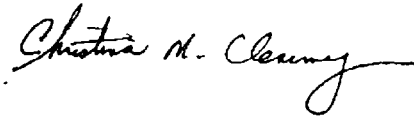
OVERALL EVALUATION OF THE DATA

The objective of the final evaluation of this data package is to identify the “analytical error” and any “sampling error” associated with the data. The sum of the “analytical error” and the “sampling error” equals the “measurement error.” The end user should use the “measurement error” in conjunction with sampling variability to determine “total error” (total uncertainty) associated with the data. Ultimately, the end user

should assess data usability in the context of the pre-determined Data Quality Objectives (DQOs) and resultant "total error" of the data.

No data were qualified.

To the best of my knowledge, after thorough review of the attached sampling data and validation information, I believe that the data does show that the Performance Standards identified in the Remedial Action Work Plan have been met.

A handwritten signature in black ink, reading "Christina M. Cleary". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

Authorized Pratt & Whitney Representative



Loureiro Engineering Associates, Inc.

To: Brian Cutler / LEA
From: Tina Clemmey / LEA
DV Report Date: 06/05/02

Project Name: Willow Brook Pond PCB Remediation
Sampled Date: 05/30/02

A Tier II data validation was performed on data for eight soil samples and one performance evaluation sample collected on May 30, 2002 for the Willow Brook Willow Pond PCB Remediation Project at Pratt & Whitney in East Hartford, Connecticut. The samples were collected from locations of the Site designated as WT-CS-09-092 through WT-CS-09-099. The sample was analyzed for PCBs by USEPA SW846 Method 8082. Samples were also submitted for "other" parameters. Validation of these parameters is discussed in a separate validation report.

The samples were submitted to Premier Laboratory, LLC in Brooklyn, CT. Premier processed and reported these samples under Project 88UT002-103. The internal laboratory lot number associated with this sample delivery group is E205C82 (batch 15418).

The sample results were assessed according to Region 1, EPA Data Validation Functional Guidelines for Evaluating Environmental Analyses: Pesticides / PCBs, July 1988. Additional guidance and logic was obtained from the Functional Guidelines for Volatile / Semivolatile Data Validation Functional Guidelines, December 1996 when applicable. Technical judgement was also applied where applicable

The following tables have been included in this report: Table 1: Tier II Data Assessment, Table 2: Samples associated with the sample delivery group (SDG), Table 3: Summary of Data Validation Qualifiers applied to samples as a result of the validation, Table 4: Summary of Qualified Analytical Results.

An explanation of the validation decisions is presented below.

SAMPLES

Samples included in this review are listed in Table 2 of this report.

PCB ANALYSES

Performance Evaluation Data

Data for performance evaluation samples (PEs) are generated to provide information on the overall accuracy and bias of the analytical method and on laboratory performance. The PE is evaluated to assess the magnitude and direction of the quantitative bias. The frequency for performance evaluation samples for this project is one per twenty field samples.

A double blind aqueous performance evaluation sample (2002491) was submitted with this data set. The PE sample was prepared by Environmental Resource Associates (ERA). The ERA lot number associated with this sample was 0528-02-03.7 Aroclor 1254 was spiked into the sample at a concentration of 5.04 ug/l. The performance acceptance limit was 2.47 - 6.85 ug/l. The laboratory reported a concentration of 4.8 ug/l. QC acceptance criteria were met. Performance data is presented in Attachment 1 of this report.

Preservation and technical holding times

The validity of the analytical results is evaluated based on the preservation techniques used and the holding time of the sample, as appropriate.

The samples were extracted and analyzed within acceptable holding time. The sample temperatures upon receipt were 14°C and 15°C. The acceptance limit for temperature is 4°C +/- 2°C. No qualification was applied since the double blind performance sample that was shipped with and analyzed with the samples in this SDG was within acceptance limits.

Agreement with the Chain of Custody

Eight soil samples, a trip blank and six aqueous performance samples were shipped to Premier Laboratory under chain of custody on 05/30/02. The samples were analyzed for PCBs by SW846 Method 8082. Validation of PCBs is discussed in this report. Validation of the "other" parameters are discussed in a separate validation report. No discrepancies were noted.

Initial Calibration and Continuing Calibration

Compliance requirements for initial and continuing calibrations are evaluated to ensure that the instruments are capable of producing acceptable qualitative and quantitative data.

Initial calibration curves were performed on GC4. Equal concentrations of a mixture of Aroclors 1016 and 1260 were used. Calibration factors were calculated at five concentrations. All percent relative standard deviations (%RSD) were less than 20%.

Continuing calibration verifications were performed on GC4. Each continuing calibration standard consisted of a mixture of Aroclors 1016 and 1260 and was performed at a single concentration. The percent drift (%D) was less than 15%. QC acceptance criteria were met for the continuing calibration.

Blanks

Blank analyses data is to determine the existence and magnitude of contamination problems resulting from laboratory and / or field activities and to subsequently assess their contribution to measurement error

No detects were reported in the method blank.

Surrogate Compounds

Sample matrix effects and laboratory performance on individual samples are assessed by evaluating surrogate recovery. Poor surrogate recovery can be an indication of Interfering matrix effects, presence of high concentration target and/or non-target analytes, and poor laboratory performance.

Surrogates tetrachloro-m-xylene and decachlorobiphenyl were spiked into every sample. QC acceptance criteria were met for percent recovery (%R) for both surrogates in all of the field samples, QC samples and blanks analyzed for PCBs. One surrogate spike was above the upper range of the acceptance limit in sample 2002487 due to matrix interference. No qualification was applied based on high percent recovery.

Matrix Spike / Matrix Spike Duplicate Analyses

Data for matrix spike / matrix spike duplicates were evaluated to determine laboratory precision and method bias for specific sample matrices.

A matrix spike / matrix spike duplicate was performed on sample 2002481 with this data set. Percent recovery and relative percent difference were within acceptance limits. All data were accepted as reported in the unspiked sample.

Laboratory Control Sample

Laboratory control samples are evaluated to assess the internal quality control of the laboratory's analytical method accuracy and method bias.

All QC acceptance criteria were met for percent recovery (%R) for the LCS samples.

Field Duplicate

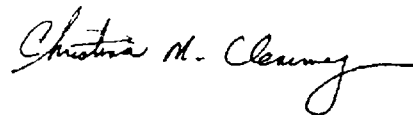
No field duplicates were submitted with this data set.

OVERALL EVALUATION OF THE DATA

The objective of the final evaluation of this data package is to identify the “analytical error” and any “sampling error” associated with the data. The sum of the “analytical error” and the “sampling error” equals the “measurement error.” The end user should use the “measurement error” in conjunction with sampling variability to determine “total error” (total uncertainty) associated with the data. Ultimately, the end user should assess data usability in the context of the pre-determined Data Quality Objectives (DQOs) and resultant “total error” of the data.

No data were qualified. Performance sample data for this sample delivery group were acceptable.

To the best of my knowledge, after thorough review of the attached sampling data and validation information, I believe that the data does show that the Performance Standards identified in the Remedial Action Work Plan have been met.

A handwritten signature in black ink, reading "Christina M. Cleary". The signature is fluid and cursive, with a long horizontal stroke at the end.

Authorized Pratt & Whitney Representative



Loureiro Engineering Associates, Inc.

To: Brian Cutler / LEA
From: Tina Clemmey / LEA
DV Report Date: 08/14/02

Project Name: Willow Brook Pond PCB Remediation
Sampled Date: 05/30/02

A Tier II data validation was performed on data for two soil samples collected on May 30, 2002 for the Willow Brook Willow Pond PCB Remediation Project at Pratt & Whitney in East Hartford, Connecticut. A trip blank (2002488) and double blind performance samples (20024921 – 2002496) were included with this sample delivery group. The samples discussed in this validation memorandum were analyzed for VOCs by SW846 Method 8260B, SVOCs by SW846 Method 8270C, TPH by USEPA 418.1, Metals by SW846 Method 6010B and Cyanide by SW846 Method 9012. These parameters are herein referred to as the “other parameters.” Validation for the samples submitted for PCBs by SW846 Method 8082 are presented in a separate validation report.

The samples were submitted to Premier Laboratory, LLC in Brooklyn, CT. Premier processed and reported these samples under Project 88UT103. The internal laboratory lot number associated with this sample delivery group is E205C82.

The sample results were assessed according to Region 1, EPA Data Validation Functional Guidelines for Evaluating Environmental Analyses: Organic Data Review (December 1996), Pesticides / PCBs Data Review (July 1988) and Inorganic Data Review (February 1989) as appropriate. Chemistry parameters were validated using the same logic as presented in Region 1, EPA validation guidelines for other

parameters where applicable. Since there is no official guidance at this time for validating general chemistry analyses. Technical judgement was applied when applicable and necessary.

The following tables have been included in this report: Table I: Summary of Tier II Data Assessment, Table II Samples associated with the sample delivery group (SDG), Table III: Summary of Data Validation Qualifiers applied to samples as a result of the validation, and Table IV: Summary of Qualified Analytical Results.

An explanation of the validation decisions is presented below.

SAMPLES

Samples included in this review are listed in Table II of this report.

ORGANIC DATA REVIEW

Organic data review includes review of analyses for volatile organic compounds (VOCs) and semivolatile organic compounds (SVOCs).

REVIEW OF ELEMENTS

Sample data were reviewed for the following parameters:

- Performance Evaluation Sample Data
- Surrogate Compounds
- Agreement with Chain-of-Custody
- Internal Standards
- Preservation and Holding Time
- Matrix Spike / Matrix Spike Duplicate

- GC/MS Instrument Performance Check
- Laboratory Control Sample
- Initial and Continuing Calibration
- Practical Quantitation Limits
- Blanks
- Tentatively Identified compounds

DISCUSSION

Agreement of Analyses with Chain of Custody

Sample reports are checked to verify that the reported results corresponded to analytical requests as detailed on the chain-of-custody record. The chain-of-custody form is reviewed for accuracy and completeness.

Samples were collected on May 30, 2002. The samples were shipped and received by Premier Laboratory, LLC under chain-of-custody on May 31, 2002. During validation, the chain-of-custody form was reviewed for accuracy and completeness. No discrepancies were noted.

VOLATILE ORGANIC ANALYSES

Performance Evaluation Data

Data for performance evaluation samples (PEs) are generated to provide information on the overall accuracy and bias of the analytical method and on laboratory performance. The PE is evaluated to assess the magnitude and direction of the quantitative bias.

A double blind aqueous performance evaluation sample was submitted with this data set as sample 2002496. The sample was prepared by Environmental Resource

Associates (ERA) from Arvada, Colorado. The ERA lot number for the VOC PE sample was 0528-02-03.2. Eighteen VOC compounds were spiked into the PE sample. The laboratory reported all eighteen compounds within the vendor-certified acceptance limits.

Preservation and technical holding times

The validity of the analytical results is evaluated based on the preservation techniques used and the holding time of the sample, as appropriate.

The sample cooler temperature recorded by the laboratory was 14.0°C and 15.0°C. The QC acceptance limit for sample temperature is 2°C – 6°C. According to Region I data validation guidelines, the VOC results for soil samples exceeding the upper temperature limit would generally be qualified such that all detects would be estimated (J) and all non-detects would be rejected. There were no detects in the affected samples. However, the non-detects were not rejected because all VOC soil samples were preserved on site in methanol according to SW846 Method 5035. All samples were extracted and analyzed within method specified holding times.

GC/MS Instrument Performance Check

Gas chromatograph / mass spectrometer (GC/MS) instrument performance (tuning) checks are evaluated to ensure proper mass calibration and resolution, identification and to some degree sensitivity.

All ion abundance acceptance criteria specified in the methods for VOCs were met for each 12-hour period that samples were analyzed.

Initial and Continuing Calibration

Compliance requirements for initial and continuing calibrations are evaluated to ensure that the instruments are capable of producing acceptable qualitative and quantitative data.

All VOC target compounds were within the QC acceptance criteria for the initial and continuing calibrations.

Blanks

Blank analyses data is to determine the existence and magnitude of contamination problems resulting from laboratory and / or field activities and to subsequently assess their contribution to measurement error

A trip blank (2002488) and the method blank were evaluated for contamination for VOCs. No detects were reported.

Surrogate Compounds

Sample matrix effects and laboratory performance on individual samples are assessed by evaluating surrogate recovery. Poor surrogate recovery can be an indication of Interfering matrix effects, presence of high concentration target and/or non-target analytes, and poor laboratory performance.

QC acceptance criteria were met for percent recovery (%R) for surrogates in all of the field samples, QC samples and blanks analyzed for VOCs with the exception of one surrogate in sample 2002481MS and two surrogates in sample 2002481MSD. All results in the unspiked sample were non-detect. Since the surrogate recoveries were high in the MS and MSD and all surrogates were within acceptance limits in the unspiked sample, no qualification was applied to the affected results.

Internal Standards

Instrument performance, stability and laboratory precision are evaluated by assessing internal standard area count recovery and retention time drift.

All VOC data for the QC acceptance criteria were met for internal standard (IS) area

counts and retention times.

Matrix Spike / Matrix Spike Duplicate Analyses

Data for matrix spike / matrix spike duplicates were evaluated to determine laboratory precision and method bias for specific sample matrices.

The laboratory performed a VOC matrix spike / matrix spike duplicate (MS/MSD) analyses on LEA soil sample 2002481. High percent recoveries were reported for m,p-Xylenes and Acetone. No detects were reported in the unspiked sample. The non-detects were accepted as reported based on high recovery. A high RPD was reported for 1,1,2,2-tetrachloroethane. The non-detected result in the unspiked sample was estimated.

Laboratory Control Sample

Laboratory control samples are evaluated to assess the internal quality control of the laboratory's analytical method accuracy and method bias.

All data met the QC acceptance criteria for percent recovery for the VOC laboratory control sample(s).

Field Duplicate

A field duplicate pair was not submitted with this data set.

Tentatively Identified Compounds

No tentatively identified compounds were reported.

SEMIVOLATILE ORGANIC ANALYSES

Performance Evaluation Data

Data for performance evaluation samples (PEs) are generated to provide information on the overall accuracy and bias of the analytical method and on laboratory performance. The PE is evaluated to assess the magnitude and direction of the quantitative bias.

A double blind aqueous performance evaluation sample was submitted as sample 2002494. The ERA lot number was 0528-02-03.1. Thirty-nine SVOC compounds were spiked into the PE sample. The laboratory reported all compounds within vendor-certified acceptance limits. The laboratory reported a false positive for 1,2,4-trichlorobenzene. No detects were reported in the associated samples for the affected compound. No qualification was necessary.

Preservation and technical holding times

The validity of the analytical results is evaluated based on the preservation techniques used and the holding time of the sample, as appropriate.

The sample cooler temperature recorded by the laboratory was 14.0°C and 15.0°C. The QC acceptance limit for sample temperature is 2°C – 6°C. All SVOC results were estimated (J) based on elevated sample temperature. Detection limits may higher than reported. Detected results may be biased low. All samples were extracted and analyzed within method specified holding times.

GC/MS Instrument Performance Check

Gas chromatograph / mass spectrometer (GC/MS) instrument performance (tuning) checks are evaluated to ensure proper mass calibration and resolution, identification and to some degree sensitivity.

All ion abundance acceptance criteria specified in the methods SVOCs were met for each 12-hour period that samples were analyzed.

Initial and Continuing Calibration

Compliance requirements for initial and continuing calibrations are evaluated to ensure that the instruments are capable of producing acceptable qualitative and quantitative data.

All SVOC target compounds were within the QC acceptance criteria for the initial and continuing calibrations.

Blanks

Blank analyses data is to determine the existence and magnitude of contamination problems resulting from laboratory and / or field activities and to subsequently assess their contribution to measurement error

The method blank was evaluated for contamination for SVOCs. No detects were reported.

Surrogate Compounds

Sample matrix effects and laboratory performance on individual samples are assessed by evaluating surrogate recovery. Poor surrogate recovery can be an indication of Interfering matrix effects, presence of high concentration target and/or non-target analytes, and poor laboratory performance.

QC acceptance criteria was met for percent recovery (%R) for surrogates in all of the field samples, QC samples and blanks analyzed for SVOCs.

Internal Standards

Instrument performance, stability and laboratory precision are evaluated by assessing internal standard area count recovery and retention time drift.

All SVOC data for the QC acceptance criteria were met for internal standard (IS) area counts and retention times.

Matrix Spike / Matrix Spike Duplicate Analyses

Data for matrix spike / matrix spike duplicates were evaluated to determine laboratory precision and method bias for specific sample matrices.

The laboratory performed an SVOC matrix spike / matrix spike duplicate (MS/MSD) analyses on LEA soil sample 2002481. All SVOC spiking compounds were within acceptance limits for %R. Fluoranthene was estimated in the unspiked sample because it was reported with a high RPD in the MS/MSD. Fluoranthene was previously estimated based on high sample temperature.

Laboratory Control Sample

Laboratory control samples are evaluated to assess the internal quality control of the laboratory's analytical method accuracy and method bias.

All data met the QC acceptance criteria for percent recovery for the SVOC laboratory control samples.

Field Duplicate

A field duplicate pair was not submitted with this data set.

Tentatively Identified Compounds

No tentatively identified compounds were reported.

INORGANIC DATA REVIEW

REVIEW OF ELEMENTS

Sample data were reviewed for the following parameters:

- | | |
|--|-------------------------------------|
| ▪ Performance Evaluation Data | ▪ Matrix Spike |
| ▪ Agreement with Chain of Custody | ▪ Field Duplicates |
| ▪ Preservation and Technical Holding Times | ▪ Laboratory Duplicates |
| | ▪ Furnace AA / Post Digestion Spike |
| ▪ Calibration Verification | ▪ Laboratory Control Sample |
| ▪ Blanks | ▪ Serial Dilution Results |
| ▪ ICP Interference Check Sample | ▪ Detection Limit Results |

DISCUSSION

Performance Evaluation Data

Data for performance evaluation samples (PEs) are generated to provide information on the overall accuracy and bias of the analytical method and on laboratory performance. The PE is evaluated to assess the magnitude and direction of the quantitative bias.

A double blind aqueous performance evaluation sample was submitted as sample 2002492 with this data set. The ERA lot number was 0528-02-03.4. Eleven metals were spiked into the PE sample. The laboratory reported all analytes within vendor certified acceptance limits.

Preservation and Holding Times

All samples were properly preserved and analyzed within method-specified holding times.

Calibration Verification

Compliance requirements are evaluated to ensure that the instrument is capable of producing acceptable quantitative data.

All initial calibration verification (ICV) and continuing calibration verification (CCV) for all metals were analyzed at the appropriate frequency and were within control limits

Blanks

Blank analyses were assessed to determine the existence and magnitude of contamination problems.

No detects were reported in the method blank. All analytes were within acceptance limit for percent recovery for the lab fortified blank (LFB) analysis with the exception of barium. Barium results were estimated in all samples in the data set based on low percent recovery in the LFB. The reported results may be biased low.

Matrix Spike / Matrix Spike Duplicate

The matrix spike sample was evaluated to provide information about the effect of the sample matrix on the digestion and measurement methodology.

A MS/MSD was performed on sample 2002481. All analytes were within acceptance limits for % recovery (%R) and Relative Percent Difference (RPD) for the MS and MSD analyses with the exception of chromium, which was above acceptance limit in

the MSD. Chromium results were estimated (J) in samples in this data set. The chromium results may be biased high.

Laboratory Duplicates

All analytes were within acceptance limits for Relative Percent Difference for the laboratory duplicate analyses. Criteria for acceptable duplicate precision is less than 35% RPD for sample results that are greater than five times the CRDL and $\pm 2X$ CRDL for sample results that are less than the five times the CRDL.

Field Duplicates

Field duplicates were assessed to determine overall precision (i.e. field and laboratory precision).

A field duplicate pair was not submitted with this data set.

Laboratory Control Sample

The laboratory control sample is evaluated to assess the efficiency of the digestion procedure.

All data were within the QC acceptance criteria for LCS percent recovery (%R).

ICP Interference Check Sample

All results were within QC acceptance limits for % recovery for the ICP Interference Check sample.

GENERAL CHEMISTRY DATA REVIEW

General Chemistry data review includes review of analyses for Total Petroleum

Hydrocarbons (TPH) and Cyanide. There are currently no Region 1 functional guidelines for data validation of general chemistry parameters. Therefore, general chemistry data are evaluated based upon the QC requirements specified in the method by which they were analyzed.

REVIEW OF ELEMENTS

Sample data were reviewed for the following parameters:

- Performance Evaluation Sample Data
- Agreement with Chain of Custody
- Preservation and Holding Time
- Initial Calibration Verification
- Continuing Calibration Verification
- Blanks
- Matrix Spike
- Field Duplicates
- Laboratory Duplicates
- Laboratory Control Sample
- Detection Limit Results

DISCUSSION

Performance Evaluation Data

Data for performance evaluation samples (PEs) are generated to provide information on the overall accuracy and bias of the analytical method and on laboratory performance. The PE is evaluated to assess the magnitude and direction of the quantitative bias.

A double blind aqueous performance evaluation sample was submitted for Cyanide as 2002493 and for TPH as 2002495. The ERA lot numbers were 0528-02-03.5 and 0528-02-03.3 respectively. Both compounds were reported within vendor certified acceptance limits.

Preservation and Holding Times

All samples analyzed for TPH and cyanide were extracted within method-specified holding times.

Initial Calibration Verification

The initial calibrations were analyzed at the appropriate frequency. The correlation coefficient for the initial calibration curve for TPH was greater than 0.9950. The %RSD was less than 20%.

All initial calibration QC acceptance criteria were met for Cyanide.

Continuing Calibration Verification

The continuing calibrations were analyzed at the appropriate frequency. The %D was below 15% for the continuing calibration analyses for TPH. All QC acceptance criteria were met for continuing calibrations for cyanide.

Blanks

No detects were reported in the associated method blanks for TPH and cyanide. All QC acceptance criteria for the blanks were acceptable

Matrix Spike

The MS / MSD was performed on sample 2002481. All data were within QC acceptance limits for TPH and cyanide.

Field Duplicate

A field duplicate pair was not submitted with this data set.

Laboratory Duplicate

Laboratory precision was demonstrated through laboratory duplicate analysis. All sample duplicate results were within QC acceptance limits for duplicate RPD.

Laboratory Control Sample

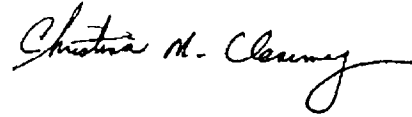
All QC acceptance criteria were met for LCS for TPH and cyanide.

OVERALL EVALUATION OF THE DATA

The objective of the final evaluation of this data package is to identify the “analytical error” and any “sampling error” associated with the data. The sum of the “analytical error” and the “sampling error” equals the “measurement error.” The end user should use the “measurement error” in conjunction with sampling variability to determine “total error” (total uncertainty) associated with the data. The data in this data package have been qualified as rejected (R) or estimated (J) depending upon the degree of analytical and / or sampling error. Ultimately, the end user should assess data usability in the context of the pre-determined Data Quality Objectives (DQOs) and resultant “total error” of the data.

VOC compound 1,1,2,2-tetrachloroethane was estimated in the unspiked sample 2002481 based on high percent recovery in the MS/MSD. All SVOC data were qualified based on elevated sample temperature. Fluoranthene was also estimated based on high RPD in the MS/MSD. All barium results were estimated based on low percent recovery in the lab fortified bland sample and all chromium results were estimated based on high recovery in the MS/MSD. No data were rejected in this data set.

To the best of my knowledge, after thorough review of the attached sampling data and validation information, I believe that the data does show that the Performance Standards identified in Remedial Action Work Plan have been met.

A handwritten signature in black ink, reading "Christina M. Cleary". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

Authorized Pratt & Whitney Representative



Loureiro Engineering Associates, Inc.

To: Brian Cutler / LEA
From: Tina Clemmey / LEA
DV Report Date: 06/05/02

Project Name: Willow Brook Pond PCB Remediation
Sampled Date: 05/30/02

A Tier II data validation was performed on data for four soil samples collected on May 30, 2002 for the Willow Brook Willow Pond PCB Remediation Project at Pratt & Whitney in East Hartford, Connecticut. The samples were collected from locations of the Site designated as WT-CS-07-025 through WT-CS-07-028. The sample was analyzed for PCBs by USEPA SW846 Method 8082. Samples were also submitted for "other" parameters. Validation of these parameters is discussed in a separate validation report.

The samples were submitted to Premier Laboratory, LLC in Brooklyn, CT. Premier processed and reported these samples under Project 88UT002-103. The internal laboratory lot number associated with this sample delivery group is E205C78 (batch 15418).

The sample results were assessed according to Region 1, EPA Data Validation Functional Guidelines for Evaluating Environmental Analyses: Pesticides / PCBs, July 1988. Additional guidance and logic was obtained from the Functional Guidelines for Volatile / Semivolatile Data Validation Functional Guidelines, December 1996 when applicable. Technical judgement was also applied where applicable

The following tables have been included in this report: Table 1: Tier II Data Assessment, Table 2: Samples associated with the sample delivery group (SDG), Table 3: Summary of Data Validation Qualifiers applied to samples as a result of the validation, Table 4: Summary of Qualified Analytical Results.

An explanation of the validation decisions is presented below.

SAMPLES

Samples included in this review are listed in Table 2 of this report.

PCB ANALYSES

Performance Evaluation Data

Data for performance evaluation samples (PEs) are generated to provide information on the overall accuracy and bias of the analytical method and on laboratory performance. The PE is evaluated to assess the magnitude and direction of the quantitative bias. The frequency for performance evaluation samples for this project is one per twenty field samples.

A double blind aqueous performance evaluation sample was not submitted with this data set.

Preservation and technical holding times

The validity of the analytical results is evaluated based on the preservation techniques used and the holding time of the sample, as appropriate.

The samples were extracted and analyzed within acceptable holding time. The sample temperatures upon receipt were 15°C. The acceptance limit for temperature is 4°C +/- 2°C. No qualification was applied since the double blind performance sample that was shipped in the same cooler and recorded at the same temperature was within

acceptance limits. The PE sample was analyzed with Lot # C205C82, batch 15418.

Agreement with the Chain of Custody

Four soil samples and a trip blank were shipped to Premier Laboratory under chain of custody on 05/31/02. The samples were analyzed for PCBs by SW846 Method 8082. Validation of PCBs is discussed in this report. Validation of the “other” parameters are discussed in a separate validation report. No discrepancies were noted.

Initial Calibration and Continuing Calibration

Compliance requirements for initial and continuing calibrations are evaluated to ensure that the instruments are capable of producing acceptable qualitative and quantitative data.

Initial calibration curves were performed on GC4. Equal concentrations of a mixture of Aroclors 1016 and 1260 were used. Calibration factors were calculated at five concentrations. All percent relative standard deviations (%RSD) were less than 20%.

Continuing calibration verifications were performed on GC4. Each continuing calibration standard consisted of a mixture of Aroclors 1016 and 1260 and was performed at a single concentration. The percent drift (%D) was less than 15%. QC acceptance criteria were met for the continuing calibration.

Blanks

Blank analyses data is to determine the existence and magnitude of contamination problems resulting from laboratory and / or field activities and to subsequently assess their contribution to measurement error

No detects were reported in the method blank.

Surrogate Compounds

Sample matrix effects and laboratory performance on individual samples are

assessed by evaluating surrogate recovery. Poor surrogate recovery can be an indication of Interfering matrix effects, presence of high concentration target and/or non-target analytes, and poor laboratory performance.

Surrogates tetrachloro-m-xylene and decachlorobiphenyl were spiked into every sample. QC acceptance criteria were met for percent recovery (%R) for both surrogates in all of the field samples, QC samples and blanks analyzed for PCBs.

Matrix Spike / Matrix Spike Duplicate Analyses

Data for matrix spike / matrix spike duplicates were evaluated to determine laboratory precision and method bias for specific sample matrices.

A matrix spike / matrix spike duplicate was performed on sample 2002460 with this data set. Percent recovery and relative percent difference were within acceptance limits. All data were accepted as reported in the unspiked sample.

Laboratory Control Sample

Laboratory control samples are evaluated to assess the internal quality control of the laboratory's analytical method accuracy and method bias.

All QC acceptance criteria were met for percent recovery (%R) for the LCS samples.

Field Duplicate

No field duplicates were submitted with this data set.

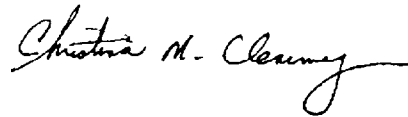
OVERALL EVALUATION OF THE DATA

The objective of the final evaluation of this data package is to identify the “analytical error” and any “sampling error” associated with the data. The sum of the “analytical

error” and the “sampling error” equals the “measurement error.” The end user should use the “measurement error” in conjunction with sampling variability to determine “total error” (total uncertainty) associated with the data. Ultimately, the end user should assess data usability in the context of the pre-determined Data Quality Objectives (DQOs) and resultant “total error” of the data.

No data were qualified.

To the best of my knowledge, after thorough review of the attached sampling data and validation information, I believe that the data does show that the Performance Standards identified in the Remedial Action Work Plan have been met.

A handwritten signature in black ink, reading "Christina M. Cleary". The signature is fluid and cursive, with a long horizontal stroke at the end.

Authorized Pratt & Whitney Representative



Loureiro Engineering Associates, Inc.

To: Brian Cutler / LEA
From: Tina Clemmey / LEA
DV Report Date: 06/10/02

Project Name: Willow Brook Pond PCB Remediation
Sampled Date: 05/30/02

A Tier II data validation was performed on data for two soil samples collected on May 30, 2002 for the Willow Brook Willow Pond PCB Remediation Project at Pratt & Whitney in East Hartford, Connecticut. A trip blank (2002489) was also included with this sample delivery group. The samples discussed in this validation memorandum were analyzed for VOCs by SW846 Method 8260B, SVOCs by SW846 Method 8270C, TPH by USEPA 418.1, Metals by SW846 Method 6010B and Cyanide by SW846 Method 9012. These parameters are herein referred to as the "other parameters." Validation for the samples submitted for PCBs by SW846 Method 8082 are presented in a separate validation report.

The samples were submitted to Premier Laboratory, LLC in Brooklyn, CT. Premier processed and reported these samples under Project 88UT103. The internal laboratory lot number associated with this sample delivery group is E205C78.

The sample results were assessed according to Region 1, EPA Data Validation Functional Guidelines for Evaluating Environmental Analyses: Organic Data Review (December 1996), Pesticides / PCBs Data Review (July 1988) and Inorganic Data Review (February 1989) as appropriate. Chemistry parameters were validated using the same logic as presented in Region 1, EPA validation guidelines for other parameters where applicable. Since there is no official guidance at this time for

validating general chemistry analyses. Technical judgement was applied when applicable and necessary.

The following tables have been included in this report: Table I: Summary of Tier II Data Assessment, Table II Samples associated with the sample delivery group (SDG), Table III: Summary of Data Validation Qualifiers applied to samples as a result of the validation, and Table IV: Summary of Qualified Analytical Results.

An explanation of the validation decisions is presented below.

SAMPLES

Samples included in this review are listed in Table II of this report.

ORGANIC DATA REVIEW

Organic data review includes review of analyses for volatile organic compounds (VOCs) and semivolatile organic compounds (SVOCs).

REVIEW OF ELEMENTS

Sample data were reviewed for the following parameters:

- Performance Evaluation Sample Data
- Surrogate Compounds
- Agreement with Chain-of-Custody
- Internal Standards
- Preservation and Holding Time
- Matrix Spike / Matrix Spike Duplicate
- GC/MS Instrument Performance Check
- Laboratory Control Sample

- Initial and Continuing Calibration
- Practical Quantitation Limits
- Blanks
- Tentatively Identified compounds

DISCUSSION

Agreement of Analyses with Chain of Custody

Sample reports are checked to verify that the reported results corresponded to analytical requests as detailed on the chain-of-custody record. The chain-of-custody form is reviewed for accuracy and completeness.

Samples were collected on May 30, 2002. The samples were shipped and received by Premier Laboratory, LLC under chain-of-custody on May 31, 2002. During validation, the chain-of-custody form was reviewed for accuracy and completeness. No discrepancies were noted.

VOLATILE ORGANIC ANALYSES

Performance Evaluation Data

Data for performance evaluation samples (PEs) are generated to provide information on the overall accuracy and bias of the analytical method and on laboratory performance. The PE is evaluated to assess the magnitude and direction of the quantitative bias.

A double blind aqueous performance evaluation sample was not submitted with this data set.

Preservation and technical holding times

The validity of the analytical results is evaluated based on the preservation techniques used and the holding time of the sample, as appropriate.

The sample cooler temperature recorded by the laboratory was 15.0°C. The QC acceptance limit for sample temperature is 2°C – 6°C. According to Region I data validation guidelines, the VOC results for soil samples exceeding the upper temperature limit would generally be qualified such that all detects would be estimated (J) and all non-detects would be rejected. There were no detects in the affected samples. However, the non-detects were not rejected because all VOC soil samples were preserved on site in methanol according to SW846 Method 5035. All samples were extracted and analyzed within method specified holding times.

GC/MS Instrument Performance Check

Gas chromatograph / mass spectrometer (GC/MS) instrument performance (tuning) checks are evaluated to ensure proper mass calibration and resolution, identification and to some degree sensitivity.

All ion abundance acceptance criteria specified in the methods for VOCs were met for each 12-hour period that samples were analyzed.

Initial and Continuing Calibration

Compliance requirements for initial and continuing calibrations are evaluated to ensure that the instruments are capable of producing acceptable qualitative and quantitative data.

All VOC target compounds were within the QC acceptance criteria for the initial and continuing calibrations.

Blanks

Blank analyses data is to determine the existence and magnitude of contamination problems resulting from laboratory and / or field activities and to subsequently assess their contribution to measurement error

A trip blank (2002489) and the method blank were evaluated for contamination for VOCs. No detects were reported.

Surrogate Compounds

Sample matrix effects and laboratory performance on individual samples are assessed by evaluating surrogate recovery. Poor surrogate recovery can be an indication of Interfering matrix effects, presence of high concentration target and/or non-target analytes, and poor laboratory performance.

QC acceptance criteria was met for percent recovery (%R) for surrogates in all of the field samples, QC samples and blanks analyzed for VOCs with the exception of one surrogate in the MSD sample 2002460. All results in the unspiked sample were non-detect. Since the surrogate recovery was high in the MSD and all surrogates were within acceptance limits in the unspiked sample as well as in the MS sample, no qualification was applied to the affected results.

Internal Standards

Instrument performance, stability and laboratory precision are evaluated by assessing internal standard area count recovery and retention time drift.

All VOC data for the QC acceptance criteria were met for internal standard (IS) area counts and retention times.

Matrix Spike / Matrix Spike Duplicate Analyses

Data for matrix spike / matrix spike duplicates were evaluated to determine laboratory precision and method bias for specific sample matrices.

The laboratory performed a VOC matrix spike / matrix spike duplicate (MS/MSD) analyses on LEA soil sample 2002460. All data were within acceptance limits for % recovery (%R) and Relative Percent Difference (RPD) for the MS and MSD analyses.

Laboratory Control Sample

Laboratory control samples are evaluated to assess the internal quality control of the laboratory's analytical method accuracy and method bias.

All data met the QC acceptance criteria for percent recovery for the VOC laboratory control sample(s).

Field Duplicate

A field duplicate pair was not submitted with this data set.

Tentatively Identified Compounds

No tentatively identified compounds were reported.

SEMIVOLATILE ORGANIC ANALYSES

Performance Evaluation Data

Data for performance evaluation samples (PEs) are generated to provide information on the overall accuracy and bias of the analytical method and on laboratory performance. The PE is evaluated to assess the magnitude and

direction of the quantitative bias.

A double blind aqueous performance evaluation sample was not submitted with this data set.

Preservation and technical holding times

The validity of the analytical results is evaluated based on the preservation techniques used and the holding time of the sample, as appropriate.

The sample cooler temperature recorded by the laboratory was 15.0°C. The QC acceptance limit for sample temperature is 2°C – 6°C. All SVOC results were estimated (J) based on elevated sample temperature. Detection limits may higher than reported. Detected results may be biased low. Detects were reported for flouranthene (350 ug/kg) and Pyrene (290 ug/kg) in sample 2002460. No detects were reported in sample 2002462. All samples were extracted and analyzed within method specified holding times.

GC/MS Instrument Performance Check

Gas chromatograph / mass spectrometer (GC/MS) instrument performance (tuning) checks are evaluated to ensure proper mass calibration and resolution, identification and to some degree sensitivity.

All ion abundance acceptance criteria specified in the methods SVOCs were met for each 12-hour period that samples were analyzed.

Initial and Continuing Calibration

Compliance requirements for initial and continuing calibrations are evaluated to ensure that the instruments are capable of producing acceptable qualitative and quantitative data.

All SVOC target compounds were within the QC acceptance criteria for the initial and continuing calibrations.

Blanks

Blank analyses data is to determine the existence and magnitude of contamination problems resulting from laboratory and / or field activities and to subsequently assess their contribution to measurement error

The method blank was evaluated for contamination for SVOCs. No detects were reported.

Surrogate Compounds

Sample matrix effects and laboratory performance on individual samples are assessed by evaluating surrogate recovery. Poor surrogate recovery can be an indication of Interfering matrix effects, presence of high concentration target and/or non-target analytes, and poor laboratory performance.

QC acceptance criteria was met for percent recovery (%R) for surrogates in all of the field samples, QC samples and blanks analyzed for SVOCs.

Internal Standards

Instrument performance, stability and laboratory precision are evaluated by assessing internal standard area count recovery and retention time drift.

All SVOC data for the QC acceptance criteria were met for internal standard (IS) area counts and retention times.

Matrix Spike / Matrix Spike Duplicate Analyses

Data for matrix spike / matrix spike duplicates were evaluated to determine

laboratory precision and method bias for specific sample matrices.

The laboratory performed an SVOC matrix spike / matrix spike duplicate (MS/MSD) analyses on LEA soil sample 2002460. All SVOC spiking compounds were within acceptance limits for %R and RPD.

Laboratory Control Sample

Laboratory control samples are evaluated to assess the internal quality control of the laboratory's analytical method accuracy and method bias.

All data met the QC acceptance criteria for percent recovery for the SVOC laboratory control samples.

Field Duplicate

A field duplicate pair was not submitted with this data set.

Tentatively Identified Compounds

No tentatively identified compounds were reported.

INORGANIC DATA REVIEW

REVIEW OF ELEMENTS

Sample data were reviewed for the following parameters:

- | | |
|--|-------------------------------------|
| ▪ Performance Evaluation Data | ▪ Matrix Spike |
| ▪ Agreement with Chain of Custody | ▪ Field Duplicates |
| ▪ Preservation and Technical Holding Times | ▪ Laboratory Duplicates |
| | ▪ Furnace AA / Post Digestion Spike |

- Calibration Verification
- Laboratory Control Sample
- Blanks
- Serial Dilution Results
- ICP Interference Check Sample
- Detection Limit Results

DISCUSSION

Performance Evaluation Data

Data for performance evaluation samples (PEs) are generated to provide information on the overall accuracy and bias of the analytical method and on laboratory performance. The PE is evaluated to assess the magnitude and direction of the quantitative bias.

A double blind aqueous performance evaluation sample was not submitted with this data set.

Preservation and Holding Times

All samples were properly preserved and analyzed within method-specified holding times.

Calibration Verification

Compliance requirements are evaluated to ensure that the instrument is capable of producing acceptable quantitative data.

All initial calibration verification (ICV) and continuing calibration verification (CCV) for all metals were analyzed at the appropriate frequency and were within control limits

Blanks

Blank analyses were assessed to determine the existence and magnitude of contamination problems.

All analytes were within acceptance limit for percent recovery for the lab fortified blank analysis. No detects were reported in the method blank.

Matrix Spike / Matrix Spike Duplicate

The matrix spike sample was evaluated to provide information about the effect of the sample matrix on the digestion and measurement methodology.

A MS/MSD was performed on sample 2002460. All analytes were within acceptance limits for % recovery (%R) and Relative Percent Difference (RPD) for the MS and MSD analyses with the exception of barium, which was slightly below the lower acceptance limit in the MSD. Barium results were estimated (J) in samples 2002460 and 2002462.

Laboratory Duplicates

All analytes were within acceptance limits for Relative Percent Difference for the laboratory duplicate analyses. Criteria for acceptable duplicate precision is less than 35% RPD for sample results that are greater than five times the CRDL and +/- 2X CRDL for sample results that are less than the five times the CRDL.

Field Duplicates

Field duplicates were assessed to determine overall precision (i.e. field and laboratory precision).

A field duplicate pair was not submitted with this data set.

Laboratory Control Sample

The laboratory control sample is evaluated to assess the efficiency of the digestion procedure.

All data were within the QC acceptance criteria for LCS percent recovery (%R).

ICP Interference Check Sample

All results were within QC acceptance limits for % recovery for the ICP Interference Check sample.

GENERAL CHEMISTRY DATA REVIEW

General Chemistry data review includes review of analyses for Total Petroleum Hydrocarbons (TPH) and Cyanide. There are currently no Region 1 functional guidelines for data validation of general chemistry parameters. Therefore, general chemistry data are evaluated based upon the QC requirements specified in the method by which they were analyzed.

REVIEW OF ELEMENTS

Sample data were reviewed for the following parameters:

- | | |
|---------------------------------------|-----------------------------|
| ▪ Performance Evaluation Sample Data | ▪ Matrix Spike |
| ▪ Agreement with Chain of Custody | ▪ Field Duplicates |
| ▪ Preservation and Holding Time | ▪ Laboratory Duplicates |
| ▪ Initial Calibration Verification | ▪ Laboratory Control Sample |
| ▪ Continuing Calibration Verification | ▪ Detection Limit Results |

- Blanks

DISCUSSION

Performance Evaluation Data

Data for performance evaluation samples (PEs) are generated to provide information on the overall accuracy and bias of the analytical method and on laboratory performance. The PE is evaluated to assess the magnitude and direction of the quantitative bias.

A double blind aqueous performance evaluation sample was not submitted with this data set.

Preservation and Holding Times

All samples analyzed for TPH and cyanide were extracted within method-specified holding times.

Initial Calibration Verification

The initial calibrations were analyzed at the appropriate frequency. The correlation coefficient for the initial calibration curve for TPH was greater than 0.9950. The %RSD was less than 20%.

All initial calibration QC acceptance criteria were met for Cyanide.

Continuing Calibration Verification

The continuing calibrations were analyzed at the appropriate frequency. The %D was below 15% for the continuing calibration analyses for TPH. All QC acceptance

criteria were met for continuing calibrations for cyanide.

Blanks

No detects were reported in the associated method blanks for TPH and cyanide. All QC acceptance criteria for the blanks were acceptable

Matrix Spike

The MS / MSD was performed on sample 2002460. All data were within QC acceptance limits for TPH and cyanide.

Field Duplicate

A field duplicate pair was not submitted with this data set.

Laboratory Duplicate

Laboratory precision was demonstrated through laboratory duplicate analysis. All sample duplicate results were within QC acceptance limits for duplicate RPD.

Laboratory Control Sample

All QC acceptance criteria were met for LCS for TPH and cyanide.

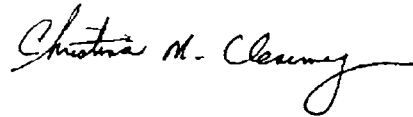
OVERALL EVALUATION OF THE DATA

The objective of the final evaluation of this data package is to identify the “analytical error” and any “sampling error” associated with the data. The sum of the “analytical error” and the “sampling error” equals the “measurement error.” The end user should use the “measurement error” in conjunction with sampling variability to determine “total error” (total uncertainty) associated with the data. The data in this data package

have been qualified as rejected (R) or estimated (J) depending upon the degree of analytical and / or sampling error. Ultimately, the end user should assess data usability in the context of the pre-determined Data Quality Objectives (DQOs) and resultant "total error" of the data.

All SVOC data were qualified based on elevated sample temperature. All barium results were qualified based on low percent recovery in the MSD sample.

To the best of my knowledge, after thorough review of the attached sampling data and validation information, I believe that the data does show that the Performance Standards identified in Remedial Action Work Plan have been met.

A handwritten signature in black ink, reading "Christina M. Cleary". The signature is fluid and cursive, with a long horizontal flourish extending to the right.

Authorized Pratt & Whitney Representative



Loureiro Engineering Associates, Inc.

To: Brian Cutler / LEA
From: Tina Clemmey / LEA
DV Report Date: 06/10/02

Project Name: Willow Brook Pond PCB Remediation
Sampled Date: 05/30/02

A Tier II data validation was performed on data for seventeen soil samples collected on May 30, 2002 for the Willow Brook Willow Pond PCB Remediation Project at Pratt & Whitney in East Hartford, Connecticut. The samples were collected from locations of the Site designated as WT-CS-09-076 through WT-CS-09-091. The sample was analyzed for PCBs by USEPA SW846 Method 8082. Samples were also submitted for "other" parameters. Validation of these parameters is discussed in a separate validation report.

The samples were submitted to Premier Laboratory, LLC in Brooklyn, CT. Premier processed and reported these samples under Project 88UT002-103. The internal laboratory lot number associated with this sample delivery group is E205C73 (batch 15418).

The sample results were assessed according to Region 1, EPA Data Validation Functional Guidelines for Evaluating Environmental Analyses: Pesticides / PCBs, July 1988. Additional guidance and logic was obtained from the Functional Guidelines for Volatile / Semivolatile Data Validation Functional Guidelines, December 1996 when applicable. Technical judgement was also applied where applicable

The following tables have been included in this report: Table 1: Tier II Data Assessment, Table 2: Samples associated with the sample delivery group (SDG), Table 3: Summary of Data Validation Qualifiers applied to samples as a result of the validation, Table 4: Summary of Qualified Analytical Results.

An explanation of the validation decisions is presented below.

SAMPLES

Samples included in this review are listed in Table 2 of this report.

PCB ANALYSES

Performance Evaluation Data

Data for performance evaluation samples (PEs) are generated to provide information on the overall accuracy and bias of the analytical method and on laboratory performance. The PE is evaluated to assess the magnitude and direction of the quantitative bias. The frequency for performance evaluation samples for this project is one per twenty field samples.

A double blind aqueous performance evaluation sample was not submitted with this data set.

Preservation and technical holding times

The validity of the analytical results is evaluated based on the preservation techniques used and the holding time of the sample, as appropriate.

The samples were extracted and analyzed within acceptable holding time. The sample temperatures upon receipt were 10°C, 12°C, and 14°C. The acceptance limit for temperature is 4°C +/- 2°C. No qualification was applied based on sample temperature. It should be noted that a performance sample (2002491) was shipped

with this set of samples. The PE sample was analyzed along with samples from the sample delivery group E205C82. The sample temperature for the samples shipped with the PE sample was recorded as 14°C and 15°C. The PE results were within the vendor certified acceptance limits.

Agreement with the Chain of Custody

Seventeen soil samples were shipped to Premier Laboratory under chain of custody on 05/31/02. The samples were analyzed for PCBs by SW846 Method 8082. Validation of PCBs is discussed in this report. Validation of the “other” parameters is discussed in a separate validation report. No discrepancies were noted.

Initial Calibration and Continuing Calibration

Compliance requirements for initial and continuing calibrations are evaluated to ensure that the instruments are capable of producing acceptable qualitative and quantitative data.

Initial calibration curves were performed on GC4. Equal concentrations of a mixture of Aroclors 1016 and 1260 were used. Calibration factors were calculated at five concentrations. All percent relative standard deviations (%RSD) were less than 20%.

Continuing calibration verifications were performed on GC4. Each continuing calibration standard consisted of a mixture of Aroclors 1016 and 1260 and was performed at a single concentration. The percent drift (%D) was less than 15%. QC acceptance criteria were met for the continuing calibration.

Blanks

Blank analyses data is to determine the existence and magnitude of contamination problems resulting from laboratory and / or field activities and to subsequently assess their contribution to measurement error

No detects were reported in the method blank.

Surrogate Compounds

Sample matrix effects and laboratory performance on individual samples are assessed by evaluating surrogate recovery. Poor surrogate recovery can be an indication of Interfering matrix effects, presence of high concentration target and/or non-target analytes, and poor laboratory performance.

Surrogates tetrachloro-m-xylene and decachlorobiphenyl were spiked into every sample. QC acceptance criteria was met for percent recovery (%R) for both surrogates in all QC samples and blanks analyzed for PCBs with the exception of samples 2002465 and 2002473. One surrogate spike in each sample was above the acceptance limit for percent recovery. It should also be noted that all three surrogates were diluted out in the following samples: 2002464, 2002474, 2002464MS and 2002464MSD.

Matrix Spike / Matrix Spike Duplicate Analyses

Data for matrix spike / matrix spike duplicates were evaluated to determine laboratory precision and method bias for specific sample matrices.

A matrix spike / matrix spike duplicate was performed on sample 2002464 with this data set. Percent recovery and relative percent difference were not calculated because the spiking compounds were diluted out.

Laboratory Control Sample

Laboratory control samples are evaluated to assess the internal quality control of the laboratory's analytical method accuracy and method bias.

All QC acceptance criteria were met for percent recovery (%R) for the LCS samples.

Field Duplicate

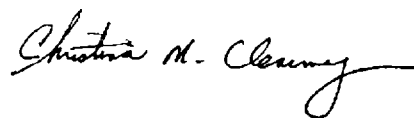
Samples 2002478 and 2002479 were submitted as a field duplicate pair with this data set. The relative percent differences (RPD) for Aroclor 1254 and 1260 were 135% and 155%. The acceptance limit for field duplicate precision in soils samples is an RPD of less than 50%. Aroclor 1254 and 1260 results were estimated (J) in both samples due to poor field duplicate precision.

OVERALL EVALUATION OF THE DATA

The objective of the final evaluation of this data package is to identify the “analytical error” and any “sampling error” associated with the data. The sum of the “analytical error” and the “sampling error” equals the “measurement error.” The end user should use the “measurement error” in conjunction with sampling variability to determine “total error” (total uncertainty) associated with the data. Ultimately, the end user should assess data usability in the context of the pre-determined Data Quality Objectives (DQOs) and resultant “total error” of the data.

Aroclor 1254 and 1260 results were estimated (J) in samples 2002478 and 2002479 due to poor field duplicate precision.

To the best of my knowledge, after thorough review of the attached sampling data and validation information, I believe that the data does show that the Performance Standards identified in the Remedial Action Work Plan have been met.



Authorized Pratt & Whitney Representative



Loureiro Engineering Associates, Inc.

To: Brian Cutler / LEA
From: Tina Clemmey / LEA
DV Report Date: 06/26/02

Project Name: Willow Brook Pond PCB Remediation
Sampled Date: 05/30/02

A Tier II data validation was performed on data for ten soil samples collected on May 30, 2002 for the Willow Brook Willow Pond PCB Remediation Project at Pratt & Whitney in East Hartford, Connecticut. A trip blank (2002490) was also included with this sample delivery group. The samples discussed in this validation memorandum were analyzed for VOCs by SW846 Method 8260B, SVOCs by SW846 Method 8270C, TPH by USEPA 418.1, Metals by SW846 Method 6010B and Cyanide by SW846 Method 9012. These parameters are herein referred to as the "other parameters." Validation for the samples submitted for PCBs by SW846 Method 8082 are presented in a separate validation report.

The samples were submitted to Premier Laboratory, LLC in Brooklyn, CT. Premier processed and reported these samples under Project 88UT103. The internal laboratory lot number associated with this sample delivery group is E205C73.

The sample results were assessed according to Region 1, EPA Data Validation Functional Guidelines for Evaluating Environmental Analyses: Organic Data Review (December 1996), Pesticides / PCBs Data Review (July 1988) and Inorganic Data Review (February 1989) as appropriate. Chemistry parameters were validated using the same logic as presented in Region 1, EPA validation guidelines for other parameters where applicable. Since there is no official guidance at this time for

validating general chemistry analyses. Technical judgement was applied when applicable and necessary.

The following tables have been included in this report: Table I: Summary of Tier II Data Assessment, Table II Samples associated with the sample delivery group (SDG), Table III: Summary of Data Validation Qualifiers applied to samples as a result of the validation, and Table IV: Summary of Qualified Analytical Results.

An explanation of the validation decisions is presented below.

SAMPLES

Samples included in this review are listed in Table II of this report.

ORGANIC DATA REVIEW

Organic data review includes review of analyses for volatile organic compounds (VOCs) and semivolatile organic compounds (SVOCs).

REVIEW OF ELEMENTS

Sample data were reviewed for the following parameters:

- Performance Evaluation Sample Data
- Surrogate Compounds
- Agreement with Chain-of-Custody
- Internal Standards
- Preservation and Holding Time
- Matrix Spike / Matrix Spike Duplicate
- GC/MS Instrument Performance Check
- Laboratory Control Sample

- Initial and Continuing Calibration
- Practical Quantitation Limits
- Blanks
- Tentatively Identified compounds

DISCUSSION

Agreement of Analyses with Chain of Custody

Sample reports are checked to verify that the reported results corresponded to analytical requests as detailed on the chain-of-custody record. The chain-of-custody form is reviewed for accuracy and completeness.

Samples were collected on May 30, 2002. The samples were shipped and received by Premier Laboratory, LLC under chain-of-custody on May 31, 2002. During validation, the chain-of-custody form was reviewed for accuracy and completeness. No discrepancies were noted.

VOLATILE ORGANIC ANALYSES

Performance Evaluation Data

Data for performance evaluation samples (PEs) are generated to provide information on the overall accuracy and bias of the analytical method and on laboratory performance. The PE is evaluated to assess the magnitude and direction of the quantitative bias.

A double blind aqueous performance evaluation sample was not submitted with this data set.

Preservation and technical holding times

The validity of the analytical results is evaluated based on the preservation techniques used and the holding time of the sample, as appropriate.

The sample cooler temperature recorded by the laboratory was 10.0°C, 12.0°C, and 14.0°C. The QC acceptance limit for sample temperature is 2°C – 6°C. According to Region I data validation guidelines, the VOC results for soil samples exceeding the upper temperature limit would generally be qualified / rejected. However, the VOC results were not qualified / rejected since the VOC soil samples were preserved on site in methanol according to SW846 Method 5035. All samples were extracted and analyzed within method specified holding times.

GC/MS Instrument Performance Check

Gas chromatograph / mass spectrometer (GC/MS) instrument performance (tuning) checks are evaluated to ensure proper mass calibration and resolution, identification and to some degree sensitivity.

All ion abundance acceptance criteria specified in the methods for VOCs were met for each 12-hour period that samples were analyzed.

Initial and Continuing Calibration

Compliance requirements for initial and continuing calibrations are evaluated to ensure that the instruments are capable of producing acceptable qualitative and quantitative data.

All VOC target compounds were within the QC acceptance criteria for the initial and continuing calibrations.

Blanks

Blank analyses data is to determine the existence and magnitude of contamination problems resulting from laboratory and / or field activities and to subsequently assess their contribution to measurement error

A trip blank (2002490) and all method blanks were evaluated for contamination for VOCs. No detects were reported.

Surrogate Compounds

Sample matrix effects and laboratory performance on individual samples are assessed by evaluating surrogate recovery. Poor surrogate recovery can be an indication of Interfering matrix effects, presence of high concentration target and/or non-target analytes, and poor laboratory performance.

QC acceptance criteria was met for percent recovery (%R) for surrogates in all of the field samples, QC samples and blanks analyzed for VOCs with the exception of one surrogate in the MSD sample 2002464. The surrogate recovery was slightly above (112%) the acceptance range (91-110%) in the MSD. All surrogates were within acceptance limits in the unspiked sample as well as in the MS sample; no qualification was applied to the affected results.

Internal Standards

Instrument performance, stability and laboratory precision are evaluated by assessing internal standard area count recovery and retention time drift.

All VOC data for the QC acceptance criteria were met for internal standard (IS) area counts and retention times.

Matrix Spike / Matrix Spike Duplicate Analyses

Data for matrix spike / matrix spike duplicates were evaluated to determine laboratory precision and method bias for specific sample matrices.

The laboratory performed a VOC matrix spike / matrix spike duplicate (MS/MSD) analyses on LEA soil sample 2002464. All data were within acceptance limits for % recovery (%R) and Relative Percent Difference (RPD) for the MS and MSD analyses.

Laboratory Control Sample

Laboratory control samples are evaluated to assess the internal quality control of the laboratory's analytical method accuracy and method bias.

All data met the QC acceptance criteria for percent recovery for the VOC laboratory control sample(s).

Field Duplicate

A field duplicate pair was submitted as samples 2002478 and 2002479. There were no detects in either sample.

Tentatively Identified Compounds

No tentatively identified compounds were reported.

SEMIVOLATILE ORGANIC ANALYSES

Performance Evaluation Data

Data for performance evaluation samples (PEs) are generated to provide information on the overall accuracy and bias of the analytical method and on

laboratory performance. The PE is evaluated to assess the magnitude and direction of the quantitative bias.

A double blind aqueous performance evaluation sample was not submitted with this data set.

Preservation and technical holding times

The validity of the analytical results is evaluated based on the preservation techniques used and the holding time of the sample, as appropriate.

The sample cooler temperature recorded by the laboratory was 10.0°C, 12.0°C and 14.0°C. The QC acceptance limit for sample temperature is 2°C – 6°C. All SVOC results were estimated (J) based on elevated sample temperature. Detection limits may higher than reported. Detected results may be biased low. All samples were extracted and analyzed within method specified holding times.

GC/MS Instrument Performance Check

Gas chromatograph / mass spectrometer (GC/MS) instrument performance (tuning) checks are evaluated to ensure proper mass calibration and resolution, identification and to some degree sensitivity.

All ion abundance acceptance criteria specified in the methods SVOCs were met for each 12-hour period that samples were analyzed.

Initial and Continuing Calibration

Compliance requirements for initial and continuing calibrations are evaluated to ensure that the instruments are capable of producing acceptable qualitative and quantitative data.

All SVOC target compounds were within the QC acceptance criteria for the initial and

continuing calibrations.

Blanks

Blank analyses data is to determine the existence and magnitude of contamination problems resulting from laboratory and / or field activities and to subsequently assess their contribution to measurement error

The method blank was evaluated for contamination for SVOCs. No detects were reported.

Surrogate Compounds

Sample matrix effects and laboratory performance on individual samples are assessed by evaluating surrogate recovery. Poor surrogate recovery can be an indication of Interfering matrix effects, presence of high concentration target and/or non-target analytes, and poor laboratory performance.

QC acceptance criteria was met for percent recovery (%R) for surrogates in all of the field samples, QC samples and blanks analyzed for SVOCs.

Internal Standards

Instrument performance, stability and laboratory precision are evaluated by assessing internal standard area count recovery and retention time drift.

All SVOC data for the QC acceptance criteria were met for internal standard (IS) area counts and retention times.

Matrix Spike / Matrix Spike Duplicate Analyses

Data for matrix spike / matrix spike duplicates were evaluated to determine laboratory precision and method bias for specific sample matrices.

The laboratory performed an SVOC matrix spike / matrix spike duplicate (MS/MSD) analyses on LEA soil sample 2002464. Several SVOC compound recoveries for the MS/MSD were outside of the established control limits due to matrix interference and dilution. The affected results were qualified in the unspiked sample accordingly. Details of qualification decisions are presented in Table III.

Laboratory Control Sample

Laboratory control samples are evaluated to assess the internal quality control of the laboratory's analytical method accuracy and method bias.

All data met the QC acceptance criteria for percent recovery for the SVOC laboratory control samples.

Field Duplicate

Samples 2002478 and 2002479 were submitted as a field duplicate pair. All results were within QC acceptance limits for RPD. Acceptable field duplicate precision was demonstrated.

Tentatively Identified Compounds

No tentatively identified compounds were reported.

INORGANIC DATA REVIEW

REVIEW OF ELEMENTS

Sample data were reviewed for the following parameters:

- Performance Evaluation Data
- Matrix Spike
- Agreement with Chain of Custody
- Field Duplicates

- Preservation and Technical Holding Times
- Calibration Verification
- Blanks
- ICP Interference Check Sample
- Laboratory Duplicates
- Furnace AA / Post Digestion Spike
- Laboratory Control Sample
- Serial Dilution Results
- Detection Limit Results

DISCUSSION

Performance Evaluation Data

Data for performance evaluation samples (PEs) are generated to provide information on the overall accuracy and bias of the analytical method and on laboratory performance. The PE is evaluated to assess the magnitude and direction of the quantitative bias.

A double blind aqueous performance evaluation sample was not submitted with this data set.

Preservation and Holding Times

All samples were properly preserved and analyzed within method-specified holding times.

Calibration Verification

Compliance requirements are evaluated to ensure that the instrument is capable of producing acceptable quantitative data.

All initial calibration verification (ICV) and continuing calibration verification (CCV) for all metals were analyzed at the appropriate frequency and were within control

limits

Blanks

Blank analyses were assessed to determine the existence and magnitude of contamination problems.

All analytes were within acceptance limit for percent recovery for the lab fortified blank analysis. No detects were reported in the method blank.

Matrix Spike / Matrix Spike Duplicate

The matrix spike sample was evaluated to provide information about the effect of the sample matrix on the digestion and measurement methodology.

A MS/MSD was performed on sample 2002464. The matrix spike/matrix spike duplicate recoveries were not evaluated for chromium, copper, nickel and lead because the sample concentration was greater than four times the spike concentration. The spike recoveries for silver, zinc and mercury were outside the established control limits due to matrix interference. All affected results were qualified in *all* samples in the data set. Refer to Table III for qualification decisions.

Laboratory Duplicates

All analytes were within acceptance limits for Relative Percent Difference for the laboratory duplicate analyses. Criteria for acceptable duplicate precision is less than 35% RPD for sample results that are greater than five times the CRDL and +/- 2X CRDL for sample results that are less than the five times the CRDL.

Field Duplicates

Field duplicates were assessed to determine overall precision (i.e. field and

laboratory precision).

Samples 2002478 and 2002479 were submitted as a field duplicate pair. All results were within acceptance limits for RPD therefore acceptable field duplicate precision was demonstrated.

Laboratory Control Sample

The laboratory control sample is evaluated to assess the efficiency of the digestion procedure.

All data were within the QC acceptance criteria for LCS percent recovery (%R).

ICP Interference Check Sample

All results were within QC acceptance limits for % recovery for the ICP Interference Check sample.

GENERAL CHEMISTRY DATA REVIEW

General Chemistry data review includes review of analyses for Total Petroleum Hydrocarbons (TPH) and Cyanide. There are currently no Region 1 functional guidelines for data validation of general chemistry parameters. Therefore, general chemistry data are evaluated based upon the QC requirements specified in the method by which they were analyzed.

REVIEW OF ELEMENTS

Sample data were reviewed for the following parameters:

- Performance Evaluation Sample Data
- Matrix Spike

- Agreement with Chain of Custody
- Field Duplicates
- Preservation and Holding Time
- Laboratory Duplicates
- Initial Calibration Verification
- Laboratory Control Sample
- Continuing Calibration Verification
- Detection Limit Results
- Blanks

DISCUSSION

Performance Evaluation Data

Data for performance evaluation samples (PEs) are generated to provide information on the overall accuracy and bias of the analytical method and on laboratory performance. The PE is evaluated to assess the magnitude and direction of the quantitative bias.

A double blind aqueous performance evaluation sample was not submitted with this data set.

Preservation and Holding Times

All samples analyzed for TPH and cyanide were extracted within method-specified holding times.

Initial Calibration Verification

The initial calibrations were analyzed at the appropriate frequency. The correlation coefficient for the initial calibration curve for TPH was greater than 0.9950. The %RSD was less than 20%.

All initial calibration QC acceptance criteria were met for Cyanide.

Continuing Calibration Verification

The continuing calibrations were analyzed at the appropriate frequency. The %D was below 15% for the continuing calibration analyses for TPH. All QC acceptance criteria were met for continuing calibrations for cyanide.

Blanks

No detects were reported in the associated method blanks for TPH and cyanide. All QC acceptance criteria for the blanks were acceptable

Matrix Spike

The MS / MSD was performed on sample 2002464. The % recovery was not evaluated for the TPH MS/MSD since the spiking compound was diluted out. Data were outside established control limits for cyanide. Cyanide results were qualified in *all* samples in this data set.

Field Duplicate

Samples 2002478 and 2002479 were submitted as a field duplicate pair. The RPD was not evaluated for cyanide since both results were non-detected. The RPD for TPH was 12%, which meets the acceptance criteria for precision of less than 50%.

Laboratory Duplicate

Laboratory precision was demonstrated through laboratory duplicate analysis. All sample duplicate results were within QC acceptance limits for duplicate RPD.

Laboratory Control Sample

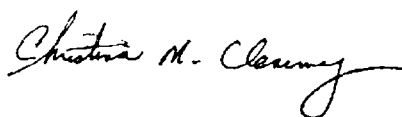
All QC acceptance criteria were met for LCS for TPH and cyanide.

OVERALL EVALUATION OF THE DATA

The objective of the final evaluation of this data package is to identify the “analytical error” and any “sampling error” associated with the data. The sum of the “analytical error” and the “sampling error” equals the “measurement error.” The end user should use the “measurement error” in conjunction with sampling variability to determine “total error” (total uncertainty) associated with the data. The data in this data package have been qualified as rejected (R) or estimated (J) depending upon the degree of analytical and / or sampling error. Ultimately, the end user should assess data usability in the context of the pre-determined Data Quality Objectives (DQOs) and resultant “total error” of the data.

All SVOC data were qualified as estimated based on elevated sample temperature. Some SVOC results for sample 2002464 were estimated (J) and some were rejected (R) based on % recovery outside control limits in the MS/MSD analyses. All silver, zinc and mercury detects in all samples in the data set were qualified as estimated (J) based on high percent recovery in the MSD sample. All non-detects were accepted as reported in all samples. All cyanide results were estimated based on %R outside control limits for the MS/MSD analyses.

To the best of my knowledge, after thorough review of the attached sampling data and validation information, I believe that the data does show that the Performance Standards identified in Remedial Action Work Plan have been met.



Authorized Pratt & Whitney Representative



Loureiro Engineering Associates, Inc.

To: Brian Cutler / LEA
From: Tina Clemmey / LEA
DV Report Date: 06/03/02

Project Name: Willow Brook Pond PCB Remediation
Sampled Date: 05/30/02

A Tier II data validation was performed on data for four soil samples collected on May 30, 2002 for the Willow Brook Willow Pond PCB Remediation Project at Pratt & Whitney in East Hartford. The samples were collected from locations of the Site designated as WT-CS-09-073 through WT-CS-09-075 and WT-CS-07-024. The sample was analyzed for PCBs by USEPA SW846 Method 8082. Samples were also submitted for "other" parameters. Validation of these parameters is discussed in a separate validation report.

The samples were submitted to Premier Laboratory, LLC in Brooklyn, CT. Premier processed and reported these samples under Project 88UT002-103. The internal laboratory lot number associated with this sample delivery group is E205C16 (batch 15401).

The sample results were assessed according to Region 1, EPA Data Validation Functional Guidelines for Evaluating Environmental Analyses: Pesticides / PCBs, July 1988. Additional guidance and logic was obtained from the Functional Guidelines for Volatile / Semivolatile Data Validation Functional Guidelines, December 1996 when applicable. Technical judgement was also applied where applicable

The following tables have been included in this report: Table 1: Tier II Data Assessment, Table 2: Samples associated with the sample delivery group (SDG), Table 3: Summary of Data Validation Qualifiers applied to samples as a result of the validation, Table 4: Summary of Qualified Analytical Results.

An explanation of the validation decisions is presented below.

SAMPLES

Samples included in this review are listed in Table 2 of this report.

PCB ANALYSES

Performance Evaluation Data

Data for performance evaluation samples (PEs) are generated to provide information on the overall accuracy and bias of the analytical method and on laboratory performance. The PE is evaluated to assess the magnitude and direction of the quantitative bias. The frequency for performance evaluation samples for this project is one per twenty field samples.

A double blind aqueous performance evaluation sample (2002458) was submitted with this data set. The PE sample was prepared by Environmental Resource Associates (ERA). The ERA lot number associated with this sample was 0528-02-03.8. Aroclor 1254 was spiked into the sample at a concentration of 7.33 ug/l. The performance acceptance limit was 3.59 – 9.97 ug/l. The laboratory reported a concentration of 6.1 ug/l. QC acceptance criteria were met. The performance data are presented in Attachment 1 of this report

Preservation and technical holding times

The validity of the analytical results is evaluated based on the preservation techniques used and the holding time of the sample, as appropriate.

The samples were extracted and analyzed within acceptable holding time. The sample temperature upon receipt was 9.4°C. The acceptance limit for temperature is 4°C +/- 2°C. No qualification was applied based on sample temperature due to the logistics of the sample transport process. Samples were collected at ambient temperature, placed in a cooler on ice and immediately transferred to the courier. The trip from the Site to the laboratory is generally completed in approximately one hour.

Agreement with the Chain of Custody

Four soil samples were shipped to Premier Laboratory under chain of custody on 05/30/02. The samples were analyzed for PCBs by SW846 Method 8082. No discrepancies were noted.

Initial Calibration and Continuing Calibration

Compliance requirements for initial and continuing calibrations are evaluated to ensure that the instruments are capable of producing acceptable qualitative and quantitative data.

Initial calibration curves were performed on GC4. Equal concentrations of a mixture of Aroclors 1016 and 1260 were used. Calibration factors were calculated at five concentrations. All percent relative standard deviations (%RSD) were less than 20%.

Continuing calibration verifications were performed on GC4. Each continuing calibration standard consisted of a mixture of Aroclors 1016 and 1260 and was performed at a single concentration. The percent drift (%D) was less than 15%. QC acceptance criteria were met for the continuing calibration.

Blanks

Blank analyses data is to determine the existence and magnitude of contamination problems resulting from laboratory and / or field activities and to subsequently assess their contribution to measurement error

No detects were reported in the method blank.

Surrogate Compounds

Sample matrix effects and laboratory performance on individual samples are assessed by evaluating surrogate recovery. Poor surrogate recovery can be an indication of Interfering matrix effects, presence of high concentration target and/or non-target analytes, and poor laboratory performance.

Surrogates tetrachloro-m-xylene and decachlorobiphenyl were spiked into every sample. QC acceptance criteria was met for percent recovery (%R) for both surrogates in all of the field samples, QC samples and blanks analyzed for PCBs.

Matrix Spike / Matrix Spike Duplicate Analyses

Data for matrix spike / matrix spike duplicates were evaluated to determine laboratory precision and method bias for specific sample matrices.

A matrix spike / matrix spike duplicate was performed on sample 2002452 with this data set. Percent recovery and relative percent difference were within acceptance limits. All data were accepted as reported in the unspiked sample.

Laboratory Control Sample

Laboratory control samples are evaluated to assess the internal quality control of the laboratory's analytical method accuracy and method bias.

All QC acceptance criteria were met for percent recovery (%R) for the LCS samples.

Field Duplicate

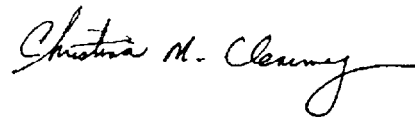
No field duplicates were submitted with this data set.

OVERALL EVALUATION OF THE DATA

The objective of the final evaluation of this data package is to identify the “analytical error” and any “sampling error” associated with the data. The sum of the “analytical error” and the “sampling error” equals the “measurement error.” The end user should use the “measurement error” in conjunction with sampling variability to determine “total error” (total uncertainty) associated with the data. Ultimately, the end user should assess data usability in the context of the pre-determined Data Quality Objectives (DQOs) and resultant “total error” of the data.

No data were qualified.

To the best of my knowledge, after thorough review of the attached sampling data and validation information, I believe that the data does show that the Performance Standards identified in the Remedial Action Work Plan have been met.

A handwritten signature in black ink, reading "Christina M. Cleary". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

Authorized Pratt & Whitney Representative



Loureiro Engineering Associates, Inc.

To: Brian Cutler / LEA
From: Tina Clemmey / LEA
DV Report Date: 06/04/02

Project Name: Willow Brook Pond PCB Remediation
Sampled Date: 05/29/02

A Tier II data validation was performed on data for twelve soil samples collected on May 29, 2002 for the Willow Brook Willow Pond PCB Remediation Project at Pratt & Whitney in East Hartford, Connecticut. The samples were collected from locations of the Site designated as WT-CS-07-014 through WT-CS-07-023 and WT-CS-09-072. The sample was analyzed for PCBs by USEPA SW846 Method 8082. Samples were also submitted for “other” parameters. Validation of these parameters is discussed in a separate validation report.

The samples were submitted to Premier Laboratory, LLC in Brooklyn, CT. Premier processed and reported these samples under Project 88UT002-103. The internal laboratory lot number associated with this sample delivery group is E205B64 (batch 15363).

The sample results were assessed according to Region 1, EPA Data Validation Functional Guidelines for Evaluating Environmental Analyses: Pesticides / PCBs, July 1988. Additional guidance and logic was obtained from the Functional Guidelines for Volatile / Semivolatile Data Validation Functional Guidelines, December 1996 when applicable. Technical judgement was also applied where applicable

The following tables have been included in this report: Table 1: Tier II Data Assessment, Table 2: Samples associated with the sample delivery group (SDG), Table 3: Summary of Data Validation Qualifiers applied to samples as a result of the validation, Table 4: Summary of Qualified Analytical Results.

An explanation of the validation decisions is presented below.

SAMPLES

Samples included in this review are listed in Table 2 of this report.

PCB ANALYSES

Performance Evaluation Data

Data for performance evaluation samples (PEs) are generated to provide information on the overall accuracy and bias of the analytical method and on laboratory performance. The PE is evaluated to assess the magnitude and direction of the quantitative bias. The frequency for performance evaluation samples for this project is one per twenty field samples.

A double blind aqueous performance evaluation sample was not submitted with this data set.

Preservation and technical holding times

The validity of the analytical results is evaluated based on the preservation techniques used and the holding time of the sample, as appropriate.

The samples were extracted and analyzed within acceptable holding time. The sample temperatures upon receipt were 5°C. The acceptance limit for temperature is 4°C +/- 2°C. No qualification was applied based on sample temperature due to the logistics of the sample transport process. Samples were collected at ambient temperature, placed

in a cooler on ice and immediately transferred to the courier. The trip from the Site to the laboratory is generally completed in approximately one hour.

Agreement with the Chain of Custody

Three soil samples were shipped to Premier Laboratory under chain of custody on 05/29/02. The samples were analyzed for PCBs by SW846 Method 8082. Validation of PCBs is discussed in this report. Validation of the "other" parameters are discussed in a separate validation report. No discrepancies were noted.

Initial Calibration and Continuing Calibration

Compliance requirements for initial and continuing calibrations are evaluated to ensure that the instruments are capable of producing acceptable qualitative and quantitative data.

Initial calibration curves were performed on GC4. Equal concentrations of a mixture of Aroclors 1016 and 1260 were used. Calibration factors were calculated at five concentrations. All percent relative standard deviations (%RSD) were less than 20%.

Continuing calibration verifications were performed on GC4. Each continuing calibration standard consisted of a mixture of Aroclors 1016 and 1260 and was performed at a single concentration. The percent drift (%D) was less than 15%. QC acceptance criteria were met for the continuing calibration.

Blanks

Blank analyses data is to determine the existence and magnitude of contamination problems resulting from laboratory and / or field activities and to subsequently assess their contribution to measurement error

No detects were reported in the method blank.

Surrogate Compounds

Sample matrix effects and laboratory performance on individual samples are assessed by evaluating surrogate recovery. Poor surrogate recovery can be an indication of Interfering matrix effects, presence of high concentration target and/or non-target analytes, and poor laboratory performance.

Surrogates tetrachloro-m-xylene and decachlorobiphenyl were spiked into every sample. QC acceptance criteria was met for percent recovery (%R) for both surrogates in all QC samples and blanks analyzed for PCBs. Surrogates were diluted out in samples 2002441 through 2002450 due to elevated concentrations of aroclors detected in the samples. One surrogate spike was above the acceptance limit in sample 2002440. Aroclor 1254 was detected in the sample. All other aroclors were non-detected (ND<540). No qualification was applied to the Aroclor 1254 result since only one surrogate was outside acceptance limits.

Matrix Spike / Matrix Spike Duplicate Analyses

Data for matrix spike / matrix spike duplicates were evaluated to determine laboratory precision and method bias for specific sample matrices.

A matrix spike / matrix spike duplicate was performed on sample 2002439 with this data set. Percent recovery and relative percent difference were within acceptance limits. All data were accepted as reported in the unspiked sample.

Laboratory Control Sample

Laboratory control samples are evaluated to assess the internal quality control of the laboratory's analytical method accuracy and method bias.

All QC acceptance criteria were met for percent recovery (%R) for the LCS samples.

Field Duplicate

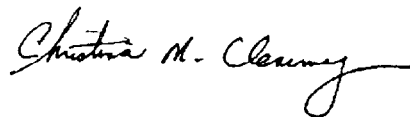
Samples 2002443 and 2002444 were submitted as a field duplicate pair with this data set. The relative percent differences (RPD) for Aroclor 1248, 1254 and 1260 were 52%, 57% and 54%. The acceptance limit for field duplicate precision in soils samples is an RPD of less than 50%. Aroclor 1248, 1254 and 1260 results were estimated (J) in both samples due to poor field duplicate precision.

OVERALL EVALUATION OF THE DATA

The objective of the final evaluation of this data package is to identify the “analytical error” and any “sampling error” associated with the data. The sum of the “analytical error” and the “sampling error” equals the “measurement error.” The end user should use the “measurement error” in conjunction with sampling variability to determine “total error” (total uncertainty) associated with the data. Ultimately, the end user should assess data usability in the context of the pre-determined Data Quality Objectives (DQOs) and resultant “total error” of the data.

Aroclor 1248, 1254 and 1260 results were estimated (J) in samples 2002443 and 2002444 due to poor field duplicate precision.

To the best of my knowledge, after thorough review of the attached sampling data and validation information, I believe that the data does show that the Performance Standards identified in the Remedial Action Work Plan have been met.



Authorized Pratt & Whitney Representative



Loureiro Engineering Associates, Inc.

To: Brian Cutler / LEA
From: Tina Clemmey / LEA
Sample Date: 05/29/02
DV Date: 07/11/02

Project Name: Willow Brook Pond PCB Remediation
DV Report for Other Parameters

A Tier II data validation was performed on data for twelve soil samples collected on May 29, 2002 for the Willow Brook Willow Pond PCB Remediation Project at Pratt & Whitney in East Hartford, Connecticut. A trip blank was included with the sample delivery group. The samples discussed in this validation memorandum were analyzed for VOCs by SW846 Method 8260B, SVOCs by SW846 Method 8270C, TPH by USEPA 418.1, Metals by SW846 Method 6010B and Cyanide by SW846 Method 9012. These parameters are herein referred to as the "other parameters." Validation for the samples submitted for PCBs by SW846 Method 8082 are presented in a separate validation report.

The samples were submitted to Premier Laboratory, LLC in Brooklyn, CT. Premier processed and reported these samples under Project 88UT103. The internal laboratory lot number associated with this sample delivery group is E205B64.

The sample results were assessed according to Region 1, EPA Data Validation Functional Guidelines for Evaluating Environmental Analyses: Organic Data Review (December 1996), Pesticides / PCBs Data Review (July 1988) and Inorganic Data Review (February 1989) as appropriate. Chemistry parameters were validated using the same logic as presented in Region 1, EPA validation guidelines for other

parameters where applicable. Since there is no official guidance at this time for validating general chemistry analyses. Technical judgement was applied when applicable and necessary.

The following tables have been included in this report: Table I: Summary of Tier II Data Assessment, Table II Samples associated with the sample delivery group (SDG), Table III: Summary of Data Validation Qualifiers applied to samples as a result of the validation, and Table IV: Summary of Qualified Analytical Results.

An explanation of the validation decisions is presented below.

SAMPLES

Samples included in this review are listed in Table II of this report.

ORGANIC DATA REVIEW

Organic data review includes review of analyses for volatile organic compounds (VOCs) and semivolatile organic compounds (SVOCs).

REVIEW OF ELEMENTS

Sample data were reviewed for the following parameters:

- | | |
|--------------------------------------|---|
| ▪ Performance Evaluation Sample Data | ▪ Surrogate Compounds |
| ▪ Agreement with Chain-of-Custody | ▪ Internal Standards |
| ▪ Preservation and Holding Time | ▪ Matrix Spike / Matrix Spike Duplicate |
| ▪ GC/MS Instrument Performance Check | ▪ Laboratory Control Sample |
| ▪ Initial and Continuing Calibration | ▪ Practical Quantitation Limits |

- Blanks
- Tentatively Identified compounds

DISCUSSION

Agreement of Analyses with Chain of Custody

Sample reports are checked to verify that the reported results corresponded to analytical requests as detailed on the chain-of-custody record. The chain-of-custody form is reviewed for accuracy and completeness.

Six soil samples and one trip blank were relinquished to Premier Laboratory, LLC under chain-of-custody on May 29, 2002. The laboratory received the samples on May 29, 2002. One soil sample was selected for “other parameters.” During validation, the chain-of-custody form was reviewed for accuracy and completeness. No discrepancies were noted.

VOLATILE ORGANIC ANALYSES

Performance Evaluation Data

Data for performance evaluation samples (PEs) are generated to provide information on the overall accuracy and bias of the analytical method and on laboratory performance. The PE is evaluated to assess the magnitude and direction of the quantitative bias.

A performance evaluation samples was not submitted with this data set.

Preservation and technical holding times

The validity of the analytical results is evaluated based on the preservation techniques used and the holding time of the sample, as appropriate.

The sample cooler temperature recorded by the laboratory was 5.0°C. The QC acceptance limit for sample temperature is 2°C – 6°C. Samples were not qualified based on sample temperature since the time from sample collection to transport to receipt at the laboratory is very short. All samples were placed on ice and in addition, all VOC soil samples were preserved on site in methanol according to SW846 Method 5035. All samples were extracted and analyzed within method specified holding times.

GC/MS Instrument Performance Check

Gas chromatograph / mass spectrometer (GC/MS) instrument performance (tuning) checks are evaluated to ensure proper mass calibration and resolution, identification and to some degree sensitivity.

All ion abundance acceptance criteria specified in the methods for VOCs were met for each 12-hour period that samples were analyzed.

Initial and Continuing Calibration

Compliance requirements for initial and continuing calibrations are evaluated to ensure that the instruments are capable of producing acceptable qualitative and quantitative data.

All VOC target compounds were within the QC acceptance criteria for the initial and continuing calibrations, with the exception of 4-Methyl-2-pentanone, and 2-Hexanone, which were qualified due to high continuing calibration drift (30.6%, and 27.1%, respectively). Refer to Table II for results.

Blanks

Blank analyses data is to determine the existence and magnitude of contamination problems resulting from laboratory and / or field activities and to subsequently assess their contribution to measurement error

The trip blank (2002451) and the method blank were evaluated for contamination for VOCs. No detects were reported in the blanks.

Surrogate Compounds

Sample matrix effects and laboratory performance on individual samples are assessed by evaluating surrogate recovery. Poor surrogate recovery can be an indication of Interfering matrix effects, presence of high concentration target and/or non-target analytes, and poor laboratory performance.

QC acceptance criteria was met for percent recovery (%R) for surrogates in all of the field samples, QC samples and blanks analyzed for VOCs.

Internal Standards

Instrument performance, stability and laboratory precision are evaluated by assessing internal standard area count recovery and retention time drift.

All internal standard area counts and retention times were within acceptance limits.

Matrix Spike / Matrix Spike Duplicate Analyses

Data for matrix spike / matrix spike duplicates were evaluated to determine laboratory precision and method bias for specific sample matrices.

The laboratory performed a VOC matrix spike / matrix spike duplicate (MS/MSD) analyses on LEA soil sample 2002441 (Batch 15379). The following table summarizes data, which did not meet QC acceptance criteria:

Compound	%Rec MS	%Rec MSD	QC limits	RPD	RPD limits	Positive detects	NDs	Bias	Affected Samples
Chloroethane	45		46-188			J	J	Low	2002441

There were no detects reported in the unspiked sample. All affected data were qualified accordingly.

Laboratory Control Sample

Laboratory control samples are evaluated to assess the internal quality control of the laboratory's analytical method accuracy and method bias.

The laboratory control samples were within acceptance limits.

Field Duplicate

Samples 2002443 / 2002444 were submitted as field duplicate pair. The RPD for 2002443 / 2002444 were not calculated since both results were non-detect.

Tentatively Identified Compounds

No tentatively identified compounds were reported.

SEMIVOLATILE ORGANIC ANALYSES

Performance Evaluation Data

Data for performance evaluation samples (PEs) are generated to provide information on the overall accuracy and bias of the analytical method and on laboratory performance. The PE is evaluated to assess the magnitude and

direction of the quantitative bias.

A performance evaluation samples was not submitted with this data set.

Preservation and technical holding times

The validity of the analytical results is evaluated based on the preservation techniques used and the holding time of the sample, as appropriate.

The sample cooler temperature recorded by the laboratory was 5.0°C. The QC acceptance limit for sample temperature is 2°C – 6°C. All samples were placed on ice during transport. All samples were extracted and analyzed within method specified holding times.

GC/MS Instrument Performance Check

Gas chromatograph / mass spectrometer (GC/MS) instrument performance (tuning) checks are evaluated to ensure proper mass calibration and resolution, identification and to some degree sensitivity.

All ion abundance acceptance criteria specified in the methods SVOCs were met for each 12-hour period that samples were analyzed.

Initial and Continuing Calibration

Compliance requirements for initial and continuing calibrations are evaluated to ensure that the instruments are capable of producing acceptable qualitative and quantitative data.

All SVOC target compounds were within the QC acceptance criteria for the initial and continuing calibrations.

Blanks

Blank analyses data is to determine the existence and magnitude of contamination problems resulting from laboratory and / or field activities and to subsequently assess their contribution to measurement error

All method blanks were evaluated for contamination for SVOCs. No detects were reported.

Surrogate Compounds

Sample matrix effects and laboratory performance on individual samples are assessed by evaluating surrogate recovery. Poor surrogate recovery can be an indication of Interfering matrix effects, presence of high concentration target and/or non-target analytes, and poor laboratory performance.

QC acceptance criteria was met for percent recovery (%R) for surrogates in all of the field samples, QC samples and blanks analyzed for SVOCs, with the exception of Nitrobenzene-d5, which was outside the acceptance criteria for samples 2002443, 200244, and 2002446. No qualifications were necessary.

Internal Standards

Instrument performance, stability and laboratory precision are evaluated by assessing internal standard area count recovery and retention time drift.

All internal standard area counts and retention times were within acceptance limits, with the exception of Chrysene-d12 and Perylene-d12, which was outside the acceptance limits for sample 2002446, due to matrix interference. The sample was re-analyzed and the internal standards were still outside the limits. All associated compounds were qualified accordingly. Refer to Table II for qualification results.

Matrix Spike / Matrix Spike Duplicate Analyses

Data for matrix spike / matrix spike duplicates were evaluated to determine laboratory precision and method bias for specific sample matrices.

The laboratory performed an SVOC matrix spike / matrix spike duplicate (MS/MSD) analyses on LEA soil sample 2002441 (Batch 15428), however, the sample concentration required a two hundred time dilution, therefore the MS / MSD recoveries were not evaluated. The associated LCS recoveries were within the established quality control limits, so not qualifications were necessary.

Laboratory Control Sample

Laboratory control samples are evaluated to assess the internal quality control of the laboratory's analytical method accuracy and method bias.

The laboratory control samples were within acceptance limits.

Field Duplicate

Samples 2002443 / 2002444 were submitted as field duplicate pair. The following table summarizes duplicate precision data:

Compound	Sample # 2002443	Duplicate # 2002444	RPD	Action	Affected Samples
Acenaphthene	5500	11000	67%	J	2002443, 2002444
Anthracene	ND	2100	NC	A	2002443, 2002444
Benzo(a)anthracene	2100	3300	44%	A	2002443, 2002444

Benzo(a)pyrene	ND	1900	NC	A	2002443, 2002444
Benzo(b)fluoranthene	ND	2400	NC	A	2002443, 2002444
Bis(2-ethylhexyl)phthalate	3500	5100	37%	A	2002443, 2002444
Chrysene	2100	3100	38%	A	2002443, 2002444
Dibenzofuran	ND	5200	NC	A	2002443, 2002444
Fluoranthene	10000	16000	46%	A	2002443, 2002444
Fluorene	3600	6500	57%	J	2002443, 2002444
2-Methylnaphthalene	8600	26000	101%	J	2002443, 2002444
Naphthalene	5300	9300	55%	J	2002443, 2002444
Phenanthrene	12000	20000	50%	J	2002443, 2002444
Pyrene	8600	14000	48%	A	2002443, 2002444

Acceptable duplicate precision for non-aqueous samples is <50% RPD for results greater than two times the detection limit. Refer to Table II for a review of the qualification results.

Tentatively Identified Compounds

No tentatively identified compounds were reported.

INORGANIC DATA REVIEW

REVIEW OF ELEMENTS

Sample data were reviewed for the following parameters:

- Performance Evaluation Data
- Agreement with Chain of Custody
- Preservation and Technical Holding Times
- Calibration Verification
- Blanks
- ICP Interference Check Sample
- Matrix Spike
- Field Duplicates
- Laboratory Duplicates
- Furnace AA / Post Digestion Spike
- Laboratory Control Sample
- Serial Dilution Results
- Detection Limit Results

DISCUSSION

Performance Evaluation Data

Data for performance evaluation samples (PEs) are generated to provide information on the overall accuracy and bias of the analytical method and on laboratory performance. The PE is evaluated to assess the magnitude and direction of the quantitative bias.

A performance evaluation samples was not submitted with this data set.

Preservation and Holding Times

All samples were properly preserved and analyzed within method-specified holding times.

Calibration Verification

Compliance requirements are evaluated to ensure that the instrument is capable of producing acceptable quantitative data.

All initial calibration verification (ICV) and continuing calibration verification (CCV) for all metals were analyzed at the appropriate frequency and were within control limits

Lab Fortified Blanks

Blank analyses were assessed to determine the existence and magnitude of contamination problems.

All analytes were within acceptance limit for percent recovery for the lab fortified blank analyses.

ICP Interference Check Sample

The ICP interference check sample is evaluated to verify the laboratory's interelement and background correction factors.

All data met the QC acceptance criteria.

Matrix Spike / Matrix Spike Duplicate

The matrix spike sample was evaluated to provide information about the effect of the sample matrix on the digestion and measurement methodology.

A MS/MSD was performed on sample 2002441. The following table summarizes data, which did not meet QC acceptance criteria:

Compound	%Rec MS	%Rec MSD	QC limits	Positive detects	NDs	Bias	Affected Samples
Barium	152.2	136.6	75-125	J	A	High	All samples in data set
Copper	194.6	192.4	75-125	J	A	High	All samples in data set
Nickel	172.7	127.3	75-125	J	A	High	All samples in data set

All affected data were qualified accordingly.

Laboratory Duplicates

All analytes were within acceptance limits for Relative Percent Difference for the laboratory duplicate analyses. Criteria for acceptable duplicate precision is less than 35% RPD for sample results that are greater than five times the CRDL and +/- 2X CRDL for sample results that are less than the five times the CRDL.

Field Duplicates

Field duplicates were assessed to determine overall precision (i.e. field and laboratory precision).

Samples 2002443 / 2002444 were submitted as field duplicate pair. The following table summarizes duplicate precision data:

Compound	Sample # 2002443	Duplicate # 2002444	RPD	Action	Affected Samples
Arsenic	0.74	0.61	NC	A	2002443, 2002444

Barium	18	17	6%	A	2002443, 2002444
Chromium	12	9.6	22%	A	2002443, 2002444
Copper	6.4	6.0	6%	A	2002443, 2002444
Lead	4.6	3.2	27%	A	2002443, 2002444
Nickel	48	48	0%	A	2002443, 2002444
Zinc	50	51	2%	A	2002443, 2002444

Acceptable duplicate precision for non-aqueous samples is <50% RPD for results greater than two times the detection limit. Results were within QC acceptance limits for all compounds.

Laboratory Control Sample

The laboratory control sample is evaluated to assess the efficiency of the digestion procedure.

The following table summarizes data that did not meet acceptance criteria (80-120%) for percent recovery (%R) criteria:

Analyte	%R	%R Range	Detects	Non-detects	Samples affected
Selenium	75.9	80-120	J	J	All

All data were qualified accordingly.

GENERAL CHEMISTRY DATA REVIEW

General Chemistry data review includes review of analyses for Total Petroleum Hydrocarbons (TPH) and Cyanide. There are currently no Region 1 functional guidelines for data validation of general chemistry parameters. Therefore, general chemistry data are evaluated based upon the QC requirements specified in the method by which they were analyzed.

REVIEW OF ELEMENTS

Sample data were reviewed for the following parameters:

- Performance Evaluation Sample Data
- Agreement with Chain of Custody
- Preservation and Holding Time
- Initial Calibration Verification
- Continuing Calibration Verification
- Blanks
- Matrix Spike
- Field Duplicates
- Laboratory Duplicates
- Laboratory Control Sample
- Detection Limit Results

DISCUSSION

Performance Evaluation Data

Data for performance evaluation samples (PEs) are generated to provide information on the overall accuracy and bias of the analytical method and on laboratory performance. The PE is evaluated to assess the magnitude and direction of the quantitative bias.

A performance evaluation samples was not submitted with this data set.

Preservation and Holding Times

All samples analyzed for TPH and cyanide were extracted within method-specified holding times.

Initial Calibration Verification

The initial calibration was analyzed at the appropriate frequency. All initial calibration QC acceptance criteria were met.

Continuing Calibration Verification

The continuing calibrations were analyzed at the appropriate frequency. The %Rs were within +/- 10% for all continuing calibration analyses. All QC acceptance criteria were met.

Blanks

No positive detects were reported in the associated method blanks. All QC acceptance criteria for the blanks were acceptable.

Matrix Spike

A MS / MSD was not performed on sample 2002441 for TPH. The samples concentration required a high dilution, which diluted out the matrix spike components. Therefore, the spike recoveries were not evaluated. However, a MS / MSD was performed on sample 2002441 for cyanide, and was within the QC acceptance limits for %R and RPD.

Field Duplicate

Samples 2002443 / 2002444 were submitted as field duplicate pair. The following

table summarizes duplicate precision data:

Compound	Sample # 2002443	Duplicate # 2002444	RPD	Action	Affected Samples
TPH	20000	31000	43%	A	2002443, 2002444

Acceptable duplicate precision for non-aqueous samples is <50% RPD for results greater than two times the detection limit. Results were within QC acceptance limits for all compounds.

Laboratory Control Sample

All QC acceptance criteria were met for LCS for TPH and cyanide.

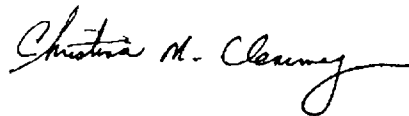
OVERALL EVALUATION OF THE DATA

The objective of the final evaluation of this data package is to identify the “analytical error” and any “sampling error” associated with the data. The sum of the “analytical error” and the “sampling error” equals the “measurement error.” The end user should use the “measurement error” in conjunction with sampling variability to determine “total error” (total uncertainty) associated with the data. The data in this data package have been qualified as rejected (R) or estimated (J) depending upon the degree of analytical and / or sampling error. Ultimately, the end user should assess data usability in the context of the pre-determined Data Quality Objectives (DQOs) and resultant “total error” of the data.

4-Methyl-2-pentanone and 2-Hexanone were qualified as estimated based on high continuing calibration drifts. Chloroethane was qualified as estimated based on a low %R for the MS analysis. Some SVOC's were qualified as estimated due to poor field duplicate precision. SVOC's associated with internal standards chrysene-d12 and perylene-d12 were qualified due to low area count recovery. Barium, Copper, and Nickel were qualified as estimated due to high MS/MSD %R. Selenium was qualified as estimated due to low LCS %R. A description of the qualified sample results are

outlined in Tables 3 and 4 specific to each parameter and are attached to this validation report.

To the best of my knowledge, after thorough review of the attached sampling data and validation information, I believe that the data does show that the Performance Standards identified in Remedial Action Work Plan.

A handwritten signature in black ink, reading "Christina M. Cleary". The signature is written in a cursive style with a long, sweeping underline.

Authorized Pratt & Whitney Representative



Loureiro Engineering Associates, Inc.

To: Brian Cutler / LEA
From: Tina Clemmey / LEA
DV Report Date: 06/03/02

Project Name: Willow Brook Pond PCB Remediation
Sampled Date: 05/29/02

A Tier II data validation was performed on data for three wood samples collected on May 29, 2002 for the Willow Brook Willow Pond PCB Remediation Project at Pratt & Whitney in East Hartford, Connecticut. The samples were collected from locations of the Site designated as WT-CS-11-027 and WT-CS-11-028. The sample was analyzed for PCBs by USEPA SW846 Method 8082.

The samples were submitted to Premier Laboratory, LLC in Brooklyn, CT. Premier processed and reported these samples under Project 88UT002-103. The internal laboratory lot number associated with this sample delivery group is E205B59 (batch 15363).

The sample results were assessed according to Region 1, EPA Data Validation Functional Guidelines for Evaluating Environmental Analyses: Pesticides / PCBs, July 1988. Additional guidance and logic was obtained from the Functional Guidelines for Volatile / Semivolatile Data Validation Functional Guidelines, December 1996 when applicable. Technical judgement was also applied where applicable

The following tables have been included in this report: Table 1: Tier II Data

Assessment, Table 2: Samples associated with the sample delivery group (SDG), Table 3: Summary of Data Validation Qualifiers applied to samples as a result of the validation, Table 4: Summary of Qualified Analytical Results.

An explanation of the validation decisions is presented below.

SAMPLES

Samples included in this review are listed in Table 2 of this report.

PCB ANALYSES

Performance Evaluation Data

Data for performance evaluation samples (PEs) are generated to provide information on the overall accuracy and bias of the analytical method and on laboratory performance. The PE is evaluated to assess the magnitude and direction of the quantitative bias. The frequency for performance evaluation samples for this project is one per twenty field samples.

A double blind aqueous performance evaluation sample was not submitted with this data set.

Preservation and technical holding times

The validity of the analytical results is evaluated based on the preservation techniques used and the holding time of the sample, as appropriate.

The samples were extracted and analyzed within acceptable holding time. The sample temperature upon receipt was 5°C, which was within the acceptance limit of 4°C +/- 2°C.

Agreement with the Chain of Custody

Three wood samples and an equipment blank were shipped to Premier Laboratory under chain of custody on 05/29/02. The samples were analyzed for PCBs by SW846 Method 8082. Validation of PCBs is discussed in this report.

Initial Calibration and Continuing Calibration

Compliance requirements for initial and continuing calibrations are evaluated to ensure that the instruments are capable of producing acceptable qualitative and quantitative data.

Initial calibration curves were performed on GC4. Equal concentrations of a mixture of Aroclors 1016 and 1260 were used. Calibration factors were calculated at five concentrations. All percent relative standard deviations (%RSD) were less than 20%.

Continuing calibration verifications were performed on GC4. Each continuing calibration standard consisted of a mixture of Aroclors 1016 and 1260 and was performed at a single concentration. The percent drift (%D) was less than 15%. QC acceptance criteria were met for the continuing calibration.

Blanks

Blank analyses data is to determine the existence and magnitude of contamination problems resulting from laboratory and / or field activities and to subsequently assess their contribution to measurement error

No detects were reported in the method blank or the equipment blank (2002457).

Surrogate Compounds

Sample matrix effects and laboratory performance on individual samples are assessed by evaluating surrogate recovery. Poor surrogate recovery can be an indication of Interfering matrix effects, presence of high concentration target and/or non-target analytes, and poor laboratory performance.

Surrogates tetrachloro-m-xylene and decachlorobiphenyl were spiked into every sample. One surrogate spike was outside stated control limits in samples 2002430, 2002431 and 2002456 due to matrix interference. Two surrogate spikes were outside stated control limits for the matrix spike and matrix spike duplicate analyses (2002430). Since all surrogates that were outside control limits exceeded the *upper* range and no detects were reported in the associated samples, the non-detects were accepted without qualification.

Matrix Spike / Matrix Spike Duplicate Analyses

Data for matrix spike / matrix spike duplicates were evaluated to determine laboratory precision and method bias for specific sample matrices.

A matrix spike / matrix spike duplicate was performed on sample 2002430 with this data set. Percent recovery and relative percent difference were not evaluated since the spiking compounds were diluted out due to matrix interference.

Laboratory Control Sample

Laboratory control samples are evaluated to assess the internal quality control of the laboratory's analytical method accuracy and method bias.

All QC acceptance criteria were met for percent recovery (%R) for the LCS samples.

Field Duplicate

Samples 2002431 and 2002456 were submitted as a field duplicate pair with this data set. All aroclor results were non-detected in both samples.


OVERALL EVALUATION OF THE DATA

The objective of the final evaluation of this data package is to identify the “analytical error” and any “sampling error” associated with the data. The sum of the “analytical

error” and the “sampling error” equals the “measurement error.” The end user should use the “measurement error” in conjunction with sampling variability to determine “total error” (total uncertainty) associated with the data. Ultimately, the end user should assess data usability in the context of the pre-determined Data Quality Objectives (DQOs) and resultant “total error” of the data.

No data were qualified. The end user should take note that surrogates were outside acceptance limits in the field samples. Since the surrogates were high and no detects were reported in the associated field samples, the non-detected results were accepted without qualification. MS/MSD analyses could not be evaluated for %R and RPD because the spiking compounds were diluted out due to matrix interference. Detection limits were also elevated to approximately 950 ug/kg due to matrix interference.

To the best of my knowledge, after thorough review of the attached sampling data and validation information, I believe that the data does show that the Performance Standards identified in the Remedial Action Work Plan have been met.

A handwritten signature in black ink, reading "Christina M. Conway". The signature is fluid and cursive, with a long horizontal stroke at the end.

Authorized Pratt & Whitney Representative



Loureiro Engineering Associates, Inc.

To: Brian Cutler / LEA
From: Tina Clemmey / LEA
DV Report Date: 05/31/02

Project Name: Willow Brook Pond PCB Remediation
Sampled Date: 05/28/02

A Tier II data validation was performed on data for three soil samples collected on May 28, 2002 for the Willow Brook Willow Pond PCB Remediation Project at Pratt & Whitney in East Hartford, Connecticut. The samples were collected from locations of the Site designated as WT-CS-07-012 and WT-CS-07-013. The sample was analyzed for PCBs by USEPA SW846 Method 8082. Samples were also submitted for “other” parameters. Validation of these parameters is discussed in a separate validation report.

The samples were submitted to Premier Laboratory, LLC in Brooklyn, CT. Premier processed and reported these samples under Project 88UT002-103. The internal laboratory lot number associated with this sample delivery group is E205B21 (batch 15327).

The sample results were assessed according to Region 1, EPA Data Validation Functional Guidelines for Evaluating Environmental Analyses: Pesticides / PCBs, July 1988. Additional guidance and logic was obtained from the Functional Guidelines for Volatile / Semivolatile Data Validation Functional Guidelines, December 1996 when applicable. Technical judgement was also applied where applicable

The following tables have been included in this report: Table 1: Tier II Data Assessment, Table 2: Samples associated with the sample delivery group (SDG), Table 3: Summary of Data Validation Qualifiers applied to samples as a result of the validation, Table 4: Summary of Qualified Analytical Results.

An explanation of the validation decisions is presented below.

SAMPLES

Samples included in this review are listed in Table 2 of this report.

PCB ANALYSES

Performance Evaluation Data

Data for performance evaluation samples (PEs) are generated to provide information on the overall accuracy and bias of the analytical method and on laboratory performance. The PE is evaluated to assess the magnitude and direction of the quantitative bias. The frequency for performance evaluation samples for this project is one per twenty field samples.

A double blind aqueous performance evaluation sample was not submitted with this data set.

Preservation and technical holding times

The validity of the analytical results is evaluated based on the preservation techniques used and the holding time of the sample, as appropriate.

The samples were extracted and analyzed within acceptable holding time. The sample temperatures upon receipt were 11°C. The acceptance limit for temperature is 4°C +/- 2°C. No qualification was applied based on sample temperature due to the logistics of the sample transport process. Samples were collected at ambient temperature, placed

in a cooler on ice and immediately transferred to the courier. The trip from the Site to the laboratory is generally completed in approximately one hour.

Agreement with the Chain of Custody

Three soil samples were shipped to Premier Laboratory under chain of custody on 05/28/02. The samples were analyzed for PCBs by SW846 Method 8082. Validation of PCBs is discussed in this report. Validation of the “other” parameters are discussed in a separate validation report. No discrepancies were noted.

Initial Calibration and Continuing Calibration

Compliance requirements for initial and continuing calibrations are evaluated to ensure that the instruments are capable of producing acceptable qualitative and quantitative data.

Initial calibration curves were performed on GC4. Equal concentrations of a mixture of Aroclors 1016 and 1260 were used. Calibration factors were calculated at five concentrations. All percent relative standard deviations (%RSD) were less than 20%.

Continuing calibration verifications were performed on GC4. Each continuing calibration standard consisted of a mixture of Aroclors 1016 and 1260 and was performed at a single concentration. The percent drift (%D) was less than 15%. QC acceptance criteria were met for the continuing calibration.

Blanks

Blank analyses data is to determine the existence and magnitude of contamination problems resulting from laboratory and / or field activities and to subsequently assess their contribution to measurement error

No detects were reported in the method blank.

Surrogate Compounds

Sample matrix effects and laboratory performance on individual samples are assessed by evaluating surrogate recovery. Poor surrogate recovery can be an indication of Interfering matrix effects, presence of high concentration target and/or non-target analytes, and poor laboratory performance.

Surrogates tetrachloro-m-xylene and decachlorobiphenyl were spiked into every sample. QC acceptance criteria was met for percent recovery (%R) for both surrogates in all of the field samples, QC samples and blanks analyzed for PCBs.

Matrix Spike / Matrix Spike Duplicate Analyses

Data for matrix spike / matrix spike duplicates were evaluated to determine laboratory precision and method bias for specific sample matrices.

A matrix spike / matrix spike duplicate was performed on sample 2002437 with this data set. Percent recovery and relative percent difference were within acceptance limits. All data were accepted as reported in the unspiked sample.

Laboratory Control Sample

Laboratory control samples are evaluated to assess the internal quality control of the laboratory's analytical method accuracy and method bias.

All QC acceptance criteria were met for percent recovery (%R) for the LCS samples.

Field Duplicate

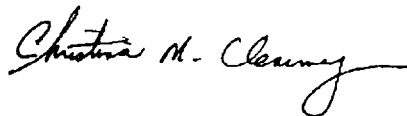
Samples 2002435 and 2002436 were submitted as a field duplicate pair with this data set. All aroclor results were non-detected in both samples.

OVERALL EVALUATION OF THE DATA

The objective of the final evaluation of this data package is to identify the “analytical error” and any “sampling error” associated with the data. The sum of the “analytical error” and the “sampling error” equals the “measurement error.” The end user should use the “measurement error” in conjunction with sampling variability to determine “total error” (total uncertainty) associated with the data. Ultimately, the end user should assess data usability in the context of the pre-determined Data Quality Objectives (DQOs) and resultant “total error” of the data.

No data were qualified.

To the best of my knowledge, after thorough review of the attached sampling data and validation information, I believe that the data does show that the Performance Standards identified in the Remedial Action Work Plan have been met.

A handwritten signature in black ink, reading "Christina M. Cleary". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

Authorized Pratt & Whitney Representative



Loureiro Engineering Associates, Inc.

To: Brian Cutler / LEA
From: Tina Clemmey / LEA
Sample Date: 05/28/02
DV Date: 06/18/02

Project Name: Willow Brook Pond PCB Remediation
DV Report for Other Parameters

A Tier II data validation was performed on data for four soil samples collected on May 28, 2002 for the Willow Brook Willow Pond PCB Remediation Project at Pratt & Whitney in East Hartford, Connecticut. A trip blank was included with the sample delivery group. The samples discussed in this validation memorandum were analyzed for VOCs by SW846 Method 8260B, SVOCs by SW846 Method 8270C, TPH by USEPA 418.1, Metals by SW846 Method 6010B and Cyanide by SW846 Method 9012. These parameters are herein referred to as the "other parameters." Validation for the samples submitted for PCBs by SW846 Method 8082 are presented in a separate validation report.

The samples were submitted to Premier Laboratory, LLC in Brooklyn, CT. Premier processed and reported these samples under Project 88UT103. The internal laboratory lot number associated with this sample delivery group is E205B21.

The sample results were assessed according to Region 1, EPA Data Validation Functional Guidelines for Evaluating Environmental Analyses: Organic Data Review (December 1996), Pesticides / PCBs Data Review (July 1988) and Inorganic Data Review (February 1989) as appropriate. Chemistry parameters were validated using the same logic as presented in Region 1, EPA validation guidelines for other

parameters where applicable. Since there is no official guidance at this time for validating general chemistry analyses. Technical judgement was applied when applicable and necessary.

The following tables have been included in this report: Table I: Summary of Tier II Data Assessment, Table II Samples associated with the sample delivery group (SDG), Table III: Summary of Data Validation Qualifiers applied to samples as a result of the validation, and Table IV: Summary of Qualified Analytical Results.

An explanation of the validation decisions is presented below.

SAMPLES

Samples included in this review are listed in Table II of this report.

ORGANIC DATA REVIEW

Organic data review includes review of analyses for volatile organic compounds (VOCs) and semivolatile organic compounds (SVOCs).

REVIEW OF ELEMENTS

Sample data were reviewed for the following parameters:

- | | |
|--------------------------------------|---|
| ▪ Performance Evaluation Sample Data | ▪ Surrogate Compounds |
| ▪ Agreement with Chain-of-Custody | ▪ Internal Standards |
| ▪ Preservation and Holding Time | ▪ Matrix Spike / Matrix Spike Duplicate |
| ▪ GC/MS Instrument Performance Check | ▪ Laboratory Control Sample |
| ▪ Initial and Continuing Calibration | ▪ Practical Quantitation Limits |

- Blanks
- Tentatively Identified compounds

DISCUSSION

Agreement of Analyses with Chain of Custody

Sample reports are checked to verify that the reported results corresponded to analytical requests as detailed on the chain-of-custody record. The chain-of-custody form is reviewed for accuracy and completeness.

Three soil samples and one trip blank were relinquished to Premier Laboratory, LLC under chain-of-custody on May 28, 2002. The laboratory received the samples on May 28, 2002. One soil sample was selected for “other parameters.” During validation, the chain-of-custody form was reviewed for accuracy and completeness. No discrepancies were noted.

VOLATILE ORGANIC ANALYSES

Performance Evaluation Data

Data for performance evaluation samples (PEs) are generated to provide information on the overall accuracy and bias of the analytical method and on laboratory performance. The PE is evaluated to assess the magnitude and direction of the quantitative bias.

A performance evaluation samples was not submitted with this data set.

Preservation and technical holding times

The validity of the analytical results is evaluated based on the preservation techniques used and the holding time of the sample, as appropriate.

The sample cooler temperature recorded by the laboratory was 11.0°C. The QC acceptance limit for sample temperature is 2°C – 6°C. Samples were not qualified based on sample temperature since the time from sample collection to transport to receipt at the laboratory is very short. All samples were placed on ice and in addition, all VOC soil samples were preserved on site in methanol according to SW846 Method 5035. All samples were extracted and analyzed within method specified holding times.

GC/MS Instrument Performance Check

Gas chromatograph / mass spectrometer (GC/MS) instrument performance (tuning) checks are evaluated to ensure proper mass calibration and resolution, identification and to some degree sensitivity.

All ion abundance acceptance criteria specified in the methods for VOCs were met for each 12-hour period that samples were analyzed.

Initial and Continuing Calibration

Compliance requirements for initial and continuing calibrations are evaluated to ensure that the instruments are capable of producing acceptable qualitative and quantitative data.

All VOC target compounds were within the QC acceptance criteria for the initial and continuing calibrations, with the exception of 4-Methyl-2-pentanone, which was qualified due to high continuing calibration drift (26.9%). Refer to Table II for results.

Blanks

Blank analyses data is to determine the existence and magnitude of contamination problems resulting from laboratory and / or field activities and to subsequently assess their contribution to measurement error

The trip blank (2002438) and the method blank were evaluated for contamination for VOCs. No detects were reported in the blanks.

Surrogate Compounds

Sample matrix effects and laboratory performance on individual samples are assessed by evaluating surrogate recovery. Poor surrogate recovery can be an indication of Interfering matrix effects, presence of high concentration target and/or non-target analytes, and poor laboratory performance.

QC acceptance criteria was met for percent recovery (%R) for surrogates in all of the field samples, QC samples and blanks analyzed for VOCs.

Internal Standards

Instrument performance, stability and laboratory precision are evaluated by assessing internal standard area count recovery and retention time drift.

All internal standard area counts and retention times were within acceptance limits.

Matrix Spike / Matrix Spike Duplicate Analyses

Data for matrix spike / matrix spike duplicates were evaluated to determine laboratory precision and method bias for specific sample matrices.

The laboratory performed a VOC matrix spike / matrix spike duplicate (MS/MSD) analyses on LEA soil sample 2002437 (Batch 15354). All data met the QC acceptance criteria.

Laboratory Control Sample

Laboratory control samples are evaluated to assess the internal quality control of the

laboratory's analytical method accuracy and method bias.

The laboratory control samples were within acceptance limits.

Field Duplicate

A few duplicate pair was not submitted with this data set. Field duplicates were submitted at a frequency of one per twenty samples and are tracked on an on-going basis.

Tentatively Identified Compounds

No tentatively identified compounds were reported.

SEMIVOLATILE ORGANIC ANALYSES

Performance Evaluation Data

Data for performance evaluation samples (PEs) are generated to provide information on the overall accuracy and bias of the analytical method and on laboratory performance. The PE is evaluated to assess the magnitude and direction of the quantitative bias.

A performance evaluation samples was not submitted with this data set.

Preservation and technical holding times

The validity of the analytical results is evaluated based on the preservation techniques used and the holding time of the sample, as appropriate.

The sample cooler temperature recorded by the laboratory was 11.0°C. The QC acceptance limit for sample temperature is 2°C – 6°C. Samples were not qualified

based on sample temperature since the time from sample collection to transport to receipt at the laboratory is very short. All samples were placed on ice during transport. All samples were extracted and analyzed within method specified holding times.

GC/MS Instrument Performance Check

Gas chromatograph / mass spectrometer (GC/MS) instrument performance (tuning) checks are evaluated to ensure proper mass calibration and resolution, identification and to some degree sensitivity.

All ion abundance acceptance criteria specified in the methods SVOCs were met for each 12-hour period that samples were analyzed.

Initial and Continuing Calibration

Compliance requirements for initial and continuing calibrations are evaluated to ensure that the instruments are capable of producing acceptable qualitative and quantitative data.

All SVOC target compounds were within the QC acceptance criteria for the initial and continuing calibrations.

Blanks

Blank analyses data is to determine the existence and magnitude of contamination problems resulting from laboratory and / or field activities and to subsequently assess their contribution to measurement error

All method blanks were evaluated for contamination for SVOCs. No detects were reported.

Surrogate Compounds

Sample matrix effects and laboratory performance on individual samples are assessed by evaluating surrogate recovery. Poor surrogate recovery can be an indication of Interfering matrix effects, presence of high concentration target and/or non-target analytes, and poor laboratory performance.

QC acceptance criteria was met for percent recovery (%R) for surrogates in all of the field samples, QC samples and blanks analyzed for SVOCs.

Internal Standards

Instrument performance, stability and laboratory precision are evaluated by assessing internal standard area count recovery and retention time drift.

All internal standard area counts and retention times were within acceptance limits.

Matrix Spike / Matrix Spike Duplicate Analyses

Data for matrix spike / matrix spike duplicates were evaluated to determine laboratory precision and method bias for specific sample matrices.

The laboratory performed an SVOC matrix spike / matrix spike duplicate (MS/MSD) analyses on LEA soil sample 2002437 (Batch 15361). The following table summarizes data, which did not meet QC acceptance criteria:

Compound	%Rec MS	%Rec MSD	QC limits	RPD	RPD limits	Positive detects	NDs	Bias	Affected Samples
1,3-Dichlorobenzene				47.4	44	J	J	High	2002437
Hexachloroethane				54.9	41	J	J	High	2002437

There were no detects reported in the unspiked sample. All affected data were qualified accordingly.

Laboratory Control Sample

Laboratory control samples are evaluated to assess the internal quality control of the laboratory's analytical method accuracy and method bias.

The laboratory control samples were within acceptance limits.

Field Duplicate

A few duplicate pair was not submitted with this data set. Field duplicates were submitted at a frequency of one per twenty samples and are tracked on an on-going basis.

Tentatively Identified Compounds

No tentatively identified compounds were reported.

INORGANIC DATA REVIEW

REVIEW OF ELEMENTS

Sample data were reviewed for the following parameters:

- Performance Evaluation Data
- Agreement with Chain of Custody
- Preservation and Technical Holding Times
- Calibration Verification
- Blanks
- ICP Interference Check Sample
- Matrix Spike
- Field Duplicates
- Laboratory Duplicates
- Furnace AA / Post Digestion Spike
- Laboratory Control Sample
- Serial Dilution Results
- Detection Limit Results

DISCUSSION

Performance Evaluation Data

Data for performance evaluation samples (PEs) are generated to provide information on the overall accuracy and bias of the analytical method and on laboratory performance. The PE is evaluated to assess the magnitude and direction of the quantitative bias.

A performance evaluation samples was not submitted with this data set.

Preservation and Holding Times

All samples were properly preserved and analyzed within method-specified holding times.

Calibration Verification

Compliance requirements are evaluated to ensure that the instrument is capable of producing acceptable quantitative data.

All initial calibration verification (ICV) and continuing calibration verification (CCV) for all metals were analyzed at the appropriate frequency and were within control limits

Lab Fortified Blanks

Blank analyses were assessed to determine the existence and magnitude of contamination problems.

All analytes were within acceptance limit for percent recovery for the lab fortified blank analyses.

ICP Interference Check Sample

The ICP interference check sample is evaluated to verify the laboratory's interelement and background correction factors.

All data met the QC acceptance criteria.

Matrix Spike / Matrix Spike Duplicate

The matrix spike sample was evaluated to provide information about the effect of the sample matrix on the digestion and measurement methodology.

A MS/MSD was performed on sample 2002437. All analytes were within acceptance limits for % recovery (%R) and Relative Percent Difference (RPD) for the MS and MSD analyses.

Laboratory Duplicates

All analytes were within acceptance limits for Relative Percent Difference for the laboratory duplicate analyses. Criteria for acceptable duplicate precision is less than

35% RPD for sample results that are greater than five times the CRDL and +/- 2X CRDL for sample results that are less than the five times the CRDL.

Field Duplicates

Field duplicates were assessed to determine overall precision (i.e. field and laboratory precision).

A few duplicate pair was not submitted with this data set. Field duplicates were submitted at a frequency of one per twenty samples and are tracked on an on-going basis.

Laboratory Control Sample

The laboratory control sample is evaluated to assess the efficiency of the digestion procedure.

The following table summarizes data that did not meet acceptance criteria (80-120%) for percent recovery (%R) criteria:

Analyte	%R	%R Range	Detects	Non-detects	Samples affected
Arsenic	126.2	80-120	J	A	All

All data were qualified accordingly.

GENERAL CHEMISTRY DATA REVIEW

General Chemistry data review includes review of analyses for Total Petroleum Hydrocarbons (TPH). There are currently no Region 1 functional guidelines for data validation of general chemistry parameters. Therefore, general chemistry data are evaluated based upon the QC requirements specified in the method by which they

were analyzed.

REVIEW OF ELEMENTS

Sample data were reviewed for the following parameters:

- Performance Evaluation Sample Data
- Agreement with Chain of Custody
- Preservation and Holding Time
- Initial Calibration Verification
- Continuing Calibration Verification
- Blanks
- Matrix Spike
- Field Duplicates
- Laboratory Duplicates
- Laboratory Control Sample
- Detection Limit Results

DISCUSSION

Performance Evaluation Data

Data for performance evaluation samples (PEs) are generated to provide information on the overall accuracy and bias of the analytical method and on laboratory performance. The PE is evaluated to assess the magnitude and direction of the quantitative bias.

A performance evaluation samples was not submitted with this data set.

Preservation and Holding Times

All samples analyzed for TPH were extracted within method-specified holding times.

Initial Calibration Verification

The initial calibration was analyzed at the appropriate frequency. All initial calibration QC acceptance criteria were met.

Continuing Calibration Verification

The continuing calibrations were analyzed at the appropriate frequency. The %Rs were within +/- 10% for all continuing calibration analyses. All QC acceptance criteria were met.

Blanks

No positive detects were reported in the associated method blanks. All QC acceptance criteria for the blanks were acceptable.

Matrix Spike

A MS / MSD was performed on sample 2002437, and was within QC acceptance limits for %R and RPD for TPH.

Field Duplicate

A few duplicate pair was not submitted with this data set. Field duplicates were submitted at a frequency of one per twenty samples and are tracked on an on-going basis.

Laboratory Control Sample

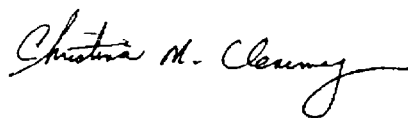
All QC acceptance criteria were met for LCS for TPH.

OVERALL EVALUATION OF THE DATA

The objective of the final evaluation of this data package is to identify the “analytical error” and any “sampling error” associated with the data. The sum of the “analytical error” and the “sampling error” equals the “measurement error.” The end user should use the “measurement error” in conjunction with sampling variability to determine “total error” (total uncertainty) associated with the data. The data in this data package have been qualified as rejected (R) or estimated (J) depending upon the degree of analytical and / or sampling error. Ultimately, the end user should assess data usability in the context of the pre-determined Data Quality Objectives (DQOs) and resultant “total error” of the data.

4-Methyl-2-pentanone was qualified as estimated based on high continuing calibration drift. 1,3-Dichlorobenzene and Hexachloroethane were qualified as estimated based on high RPD for the MS/MSD analysis. A description of the qualified sample results are outlined in Tables 3 and 4 specific to each parameter and are attached to this validation report.

To the best of my knowledge, after thorough review of the attached sampling data and validation information, I believe that the data does show that the Performance Standards identified in Remedial Action Work Plan.



Authorized Pratt & Whitney Representative



Loureiro Engineering Associates, Inc.

To: Brian Cutler / LEA
From: Tina Clemmey / LEA
DV Report Date: 05/31/02

Project Name: Willow Brook Pond PCB Remediation
Sampled Date: 05/24/02

A Tier II data validation was performed on data for two soil samples collected on May 24, 2002 for the Willow Brook Willow Pond PCB Remediation Project at Pratt & Whitney in East Hartford, Connecticut. The samples were collected from locations of the Site designated as WT-CS-07-010 and WT-CS-07-011. The sample was analyzed for PCBs by USEPA SW846 Method 8082. Samples were also submitted for “other” parameters. Validation of these parameters is discussed in a separate validation report.

The samples were submitted to Premier Laboratory, LLC in Brooklyn, CT. Premier processed and reported these samples under Project 88UT002-103. The internal laboratory lot number associated with this sample delivery group is E205B11 (batch 15327).

The sample results were assessed according to Region 1, EPA Data Validation Functional Guidelines for Evaluating Environmental Analyses: Pesticides / PCBs, July 1988. Additional guidance and logic was obtained from the Functional Guidelines for Volatile / Semivolatile Data Validation Functional Guidelines, December 1996 when applicable. Technical judgement was also applied where applicable

The following tables have been included in this report: Table 1: Tier II Data Assessment, Table 2: Samples associated with the sample delivery group (SDG), Table 3: Summary of Data Validation Qualifiers applied to samples as a result of the validation, Table 4: Summary of Qualified Analytical Results.

An explanation of the validation decisions is presented below.

SAMPLES

Samples included in this review are listed in Table 2 of this report.

PCB ANALYSES

Performance Evaluation Data

Data for performance evaluation samples (PEs) are generated to provide information on the overall accuracy and bias of the analytical method and on laboratory performance. The PE is evaluated to assess the magnitude and direction of the quantitative bias. The frequency for performance evaluation samples for this project is one per twenty field samples.

A double blind aqueous performance evaluation sample was not submitted with this data set.

Preservation and technical holding times

The validity of the analytical results is evaluated based on the preservation techniques used and the holding time of the sample, as appropriate.

The samples were extracted and analyzed within acceptable holding time. The sample temperatures upon receipt were 9°C. The acceptance limit for temperature is 4°C +/- 2°C. No qualification was applied based on sample temperature due to the logistics of the sample transport process. Samples were collected at ambient temperature, placed

in a cooler on ice and immediately transferred to the courier. The trip from the Site to the laboratory is generally completed in approximately one hour.

Agreement with the Chain of Custody

Two soil samples were shipped to Premier Laboratory under chain of custody on 05/24/02. The samples were analyzed for PCBs by SW846 Method 8082. Validation of PCBs is discussed in this report. Validation of the “other” parameters are discussed in a separate validation report. No discrepancies were noted.

Initial Calibration and Continuing Calibration

Compliance requirements for initial and continuing calibrations are evaluated to ensure that the instruments are capable of producing acceptable qualitative and quantitative data.

Initial calibration curves were performed on GC4. Equal concentrations of a mixture of Aroclors 1016 and 1260 were used. Calibration factors were calculated at five concentrations. All percent relative standard deviations (%RSD) were less than 20%.

Continuing calibration verifications were performed on GC4. Each continuing calibration standard consisted of a mixture of Aroclors 1016 and 1260 and was performed at a single concentration. The percent drift (%D) was less than 15%. QC acceptance criteria were met for the continuing calibration.

Blanks

Blank analyses data is to determine the existence and magnitude of contamination problems resulting from laboratory and / or field activities and to subsequently assess their contribution to measurement error

No detects were reported in the method blank.

Surrogate Compounds

Sample matrix effects and laboratory performance on individual samples are assessed by evaluating surrogate recovery. Poor surrogate recovery can be an indication of Interfering matrix effects, presence of high concentration target and/or non-target analytes, and poor laboratory performance.

Surrogates tetrachloro-m-xylene and decachlorobiphenyl were spiked into every sample. QC acceptance criteria was met for percent recovery (%R) for both surrogates in all of the field samples, QC samples and blanks analyzed for PCBs.

Matrix Spike / Matrix Spike Duplicate Analyses

Data for matrix spike / matrix spike duplicates were evaluated to determine laboratory precision and method bias for specific sample matrices.

A matrix spike / matrix spike duplicate was performed on sample 2002433 with this data set. Percent recovery and relative percent difference were within acceptance limits. All data were accepted as reported in the unspiked sample.

Laboratory Control Sample

Laboratory control samples are evaluated to assess the internal quality control of the laboratory's analytical method accuracy and method bias.

All QC acceptance criteria were met for percent recovery (%R) for the LCS samples.

Field Duplicate

No field duplicates were submitted with this data set.

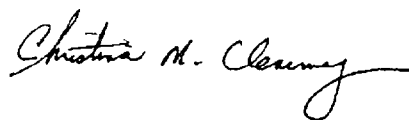
OVERALL EVALUATION OF THE DATA

The objective of the final evaluation of this data package is to identify the “analytical

error” and any “sampling error” associated with the data. The sum of the “analytical error” and the “sampling error” equals the “measurement error.” The end user should use the “measurement error” in conjunction with sampling variability to determine “total error” (total uncertainty) associated with the data. Ultimately, the end user should assess data usability in the context of the pre-determined Data Quality Objectives (DQOs) and resultant “total error” of the data.

No data were qualified.

To the best of my knowledge, after thorough review of the attached sampling data and validation information, I believe that the data does show that the Performance Standards identified in the Remedial Action Work Plan have been met.

A handwritten signature in black ink, reading "Christina M. Cleary". The signature is fluid and cursive, with a long horizontal stroke at the end.

Authorized Pratt & Whitney Representative



Loureiro Engineering Associates, Inc.

To: Brian Cutler / LEA
From: Tina Clemmey / LEA
Sample Date: 05/24/02
DV Date: 06/18/02

Project Name: Willow Brook Pond PCB Remediation
DV Report for Other Parameters

A Tier II data validation was performed on data for two soil samples collected on May 24, 2002 for the Willow Brook Willow Pond PCB Remediation Project at Pratt & Whitney in East Hartford, Connecticut. A trip blank was included with the sample delivery group. The samples discussed in this validation memorandum were analyzed for VOCs by SW846 Method 8260B, SVOCs by SW846 Method 8270C, TPH by USEPA 418.1, Metals by SW846 Method 6010B and Cyanide by SW846 Method 9012. These parameters are herein referred to as the "other parameters." Validation for the samples submitted for PCBs by SW846 Method 8082 are presented in a separate validation report.

The samples were submitted to Premier Laboratory, LLC in Brooklyn, CT. Premier processed and reported these samples under Project 88UT103. The internal laboratory lot number associated with this sample delivery group is E205B11.

The sample results were assessed according to Region 1, EPA Data Validation Functional Guidelines for Evaluating Environmental Analyses: Organic Data Review (December 1996), Pesticides / PCBs Data Review (July 1988) and Inorganic Data Review (February 1989) as appropriate. Chemistry parameters were validated using the same logic as presented in Region 1, EPA validation guidelines for other

parameters where applicable. Since there is no official guidance at this time for validating general chemistry analyses. Technical judgement was applied when applicable and necessary.

The following tables have been included in this report: Table I: Summary of Tier II Data Assessment, Table II Samples associated with the sample delivery group (SDG), Table III: Summary of Data Validation Qualifiers applied to samples as a result of the validation, and Table IV: Summary of Qualified Analytical Results.

An explanation of the validation decisions is presented below.

SAMPLES

Samples included in this review are listed in Table II of this report.

ORGANIC DATA REVIEW

Organic data review includes review of analyses for volatile organic compounds (VOCs) and semivolatile organic compounds (SVOCs).

REVIEW OF ELEMENTS

Sample data were reviewed for the following parameters:

- | | |
|--------------------------------------|---|
| ▪ Performance Evaluation Sample Data | ▪ Surrogate Compounds |
| ▪ Agreement with Chain-of-Custody | ▪ Internal Standards |
| ▪ Preservation and Holding Time | ▪ Matrix Spike / Matrix Spike Duplicate |
| ▪ GC/MS Instrument Performance Check | ▪ Laboratory Control Sample |
| ▪ Initial and Continuing Calibration | ▪ Practical Quantitation Limits |

- Blanks
- Tentatively Identified compounds

DISCUSSION

Agreement of Analyses with Chain of Custody

Sample reports are checked to verify that the reported results corresponded to analytical requests as detailed on the chain-of-custody record. The chain-of-custody form is reviewed for accuracy and completeness.

Three soil samples and one trip blank were relinquished to Premier Laboratory, LLC under chain-of-custody on May 24, 2002. The laboratory received the samples on May 24, 2002. One soil sample was selected for “other parameters.” During validation, the chain-of-custody form was reviewed for accuracy and completeness. No discrepancies were noted.

VOLATILE ORGANIC ANALYSES

Performance Evaluation Data

Data for performance evaluation samples (PEs) are generated to provide information on the overall accuracy and bias of the analytical method and on laboratory performance. The PE is evaluated to assess the magnitude and direction of the quantitative bias.

A performance evaluation samples was not submitted with this data set.

Preservation and technical holding times

The validity of the analytical results is evaluated based on the preservation techniques used and the holding time of the sample, as appropriate.

The sample cooler temperature recorded by the laboratory was 9.0°C. The QC acceptance limit for sample temperature is 2°C – 6°C. Samples were not qualified based on sample temperature since the time from sample collection to transport to receipt at the laboratory is very short. All samples were placed on ice and in addition, all VOC soil samples were preserved on site in methanol according to SW846 Method 5035. All samples were extracted and analyzed within method specified holding times.

GC/MS Instrument Performance Check

Gas chromatograph / mass spectrometer (GC/MS) instrument performance (tuning) checks are evaluated to ensure proper mass calibration and resolution, identification and to some degree sensitivity.

All ion abundance acceptance criteria specified in the methods for VOCs were met for each 12-hour period that samples were analyzed.

Initial and Continuing Calibration

Compliance requirements for initial and continuing calibrations are evaluated to ensure that the instruments are capable of producing acceptable qualitative and quantitative data.

All VOC target compounds were within the QC acceptance criteria for the initial and continuing calibrations.

Blanks

Blank analyses data is to determine the existence and magnitude of contamination problems resulting from laboratory and / or field activities and to subsequently assess their contribution to measurement error

The trip blank (2002434) and the method blank were evaluated for contamination for VOCs. No detects were reported in the blanks.

Surrogate Compounds

Sample matrix effects and laboratory performance on individual samples are assessed by evaluating surrogate recovery. Poor surrogate recovery can be an indication of Interfering matrix effects, presence of high concentration target and/or non-target analytes, and poor laboratory performance.

QC acceptance criteria was met for percent recovery (%R) for surrogates in all of the field samples, QC samples and blanks analyzed for VOCs.

Internal Standards

Instrument performance, stability and laboratory precision are evaluated by assessing internal standard area count recovery and retention time drift.

All internal standard area counts and retention times were within acceptance limits.

Matrix Spike / Matrix Spike Duplicate Analyses

Data for matrix spike / matrix spike duplicates were evaluated to determine laboratory precision and method bias for specific sample matrices.

The laboratory performed a VOC matrix spike / matrix spike duplicate (MS/MSD) analyses on LEA soil sample 2002433 (Batch 15354). All data met the QC acceptance criteria.

Laboratory Control Sample

Laboratory control samples are evaluated to assess the internal quality control of the

laboratory's analytical method accuracy and method bias.

The laboratory control samples were within acceptance limits.

Field Duplicate

A few duplicate pair was not submitted with this data set. Field duplicates were submitted at a frequency of one per twenty samples and are tracked on an on-going basis.

Tentatively Identified Compounds

No tentatively identified compounds were reported.

SEMIVOLATILE ORGANIC ANALYSES

Performance Evaluation Data

Data for performance evaluation samples (PEs) are generated to provide information on the overall accuracy and bias of the analytical method and on laboratory performance. The PE is evaluated to assess the magnitude and direction of the quantitative bias.

A performance evaluation samples was not submitted with this data set.

Preservation and technical holding times

The validity of the analytical results is evaluated based on the preservation techniques used and the holding time of the sample, as appropriate.

The sample cooler temperature recorded by the laboratory was 9.0°C. The QC acceptance limit for sample temperature is 2°C – 6°C. Samples were not qualified

based on sample temperature since the time from sample collection to transport to receipt at the laboratory is very short. All samples were placed on ice during transport. All samples were extracted and analyzed within method specified holding times.

GC/MS Instrument Performance Check

Gas chromatograph / mass spectrometer (GC/MS) instrument performance (tuning) checks are evaluated to ensure proper mass calibration and resolution, identification and to some degree sensitivity.

All ion abundance acceptance criteria specified in the methods SVOCs were met for each 12-hour period that samples were analyzed.

Initial and Continuing Calibration

Compliance requirements for initial and continuing calibrations are evaluated to ensure that the instruments are capable of producing acceptable qualitative and quantitative data.

All SVOC target compounds were within the QC acceptance criteria for the initial and continuing calibrations.

Blanks

Blank analyses data is to determine the existence and magnitude of contamination problems resulting from laboratory and / or field activities and to subsequently assess their contribution to measurement error

All method blanks were evaluated for contamination for SVOCs. No detects were reported.

Surrogate Compounds

Sample matrix effects and laboratory performance on individual samples are assessed by evaluating surrogate recovery. Poor surrogate recovery can be an indication of Interfering matrix effects, presence of high concentration target and/or non-target analytes, and poor laboratory performance.

QC acceptance criteria was met for percent recovery (%R) for surrogates in all of the field samples, QC samples and blanks analyzed for SVOCs.

Internal Standards

Instrument performance, stability and laboratory precision are evaluated by assessing internal standard area count recovery and retention time drift.

All internal standard area counts and retention times were within acceptance limits.

Matrix Spike / Matrix Spike Duplicate Analyses

Data for matrix spike / matrix spike duplicates were evaluated to determine laboratory precision and method bias for specific sample matrices.

The laboratory performed an SVOC matrix spike / matrix spike duplicate (MS/MSD) analyses on LEA soil sample 2002433 (Batch 15361). All data met the QC acceptance criteria.

Laboratory Control Sample

Laboratory control samples are evaluated to assess the internal quality control of the laboratory's analytical method accuracy and method bias.

The laboratory control samples were within acceptance limits.

Field Duplicate

A few duplicate pair was not submitted with this data set. Field duplicates were submitted at a frequency of one per twenty samples and are tracked on an on-going basis.

Tentatively Identified Compounds

No tentatively identified compounds were reported.

INORGANIC DATA REVIEW

REVIEW OF ELEMENTS

Sample data were reviewed for the following parameters:

- | | |
|--|-------------------------------------|
| ▪ Performance Evaluation Data | ▪ Matrix Spike |
| ▪ Agreement with Chain of Custody | ▪ Field Duplicates |
| ▪ Preservation and Technical Holding Times | ▪ Laboratory Duplicates |
| | ▪ Furnace AA / Post Digestion Spike |
| ▪ Calibration Verification | ▪ Laboratory Control Sample |
| ▪ Blanks | ▪ Serial Dilution Results |
| ▪ ICP Interference Check Sample | ▪ Detection Limit Results |

DISCUSSION

Performance Evaluation Data

Data for performance evaluation samples (PEs) are generated to provide

information on the overall accuracy and bias of the analytical method and on laboratory performance. The PE is evaluated to assess the magnitude and direction of the quantitative bias.

A performance evaluation samples was not submitted with this data set.

Preservation and Holding Times

All samples were properly preserved and analyzed within method-specified holding times.

Calibration Verification

Compliance requirements are evaluated to ensure that the instrument is capable of producing acceptable quantitative data.

All initial calibration verification (ICV) and continuing calibration verification (CCV) for all metals were analyzed at the appropriate frequency and were within control limits

Lab Fortified Blanks

Blank analyses were assessed to determine the existence and magnitude of contamination problems.

All analytes were within acceptance limit for percent recovery for the lab fortified blank analyses.

ICP Interference Check Sample

The ICP interference check sample is evaluated to verify the laboratory's interelement and background correction factors.

All data met the QC acceptance criteria.

Matrix Spike / Matrix Spike Duplicate

The matrix spike sample was evaluated to provide information about the effect of the sample matrix on the digestion and measurement methodology.

A MS/MSD was performed on sample 2002433. All analytes were within acceptance limits for % recovery (%R) and Relative Percent Difference (RPD) for the MS and MSD analyses.

Laboratory Duplicates

All analytes were within acceptance limits for Relative Percent Difference for the laboratory duplicate analyses. Criteria for acceptable duplicate precision is less than 35% RPD for sample results that are greater than five times the CRDL and +/- 2X CRDL for sample results that are less than the five times the CRDL.

Field Duplicates

Field duplicates were assessed to determine overall precision (i.e. field and laboratory precision).

A few duplicate pair was not submitted with this data set. Field duplicates were submitted at a frequency of one per twenty samples and are tracked on an on-going basis.

Laboratory Control Sample

The laboratory control sample is evaluated to assess the efficiency of the digestion procedure.

The following table summarizes data that did not meet acceptance criteria (80-120%) for percent recovery (%R) criteria:

Analyte	%R	%R Range	Detects	Non-detects	Samples affected
Arsenic	126.2	80-120	J	A	All

All data were qualified accordingly.

GENERAL CHEMISTRY DATA REVIEW

General Chemistry data review includes review of analyses for Total Petroleum Hydrocarbons (TPH). There are currently no Region 1 functional guidelines for data validation of general chemistry parameters. Therefore, general chemistry data are evaluated based upon the QC requirements specified in the method by which they were analyzed.

REVIEW OF ELEMENTS

Sample data were reviewed for the following parameters:

- Performance Evaluation Sample Data
- Agreement with Chain of Custody
- Preservation and Holding Time
- Initial Calibration Verification
- Continuing Calibration Verification
- Blanks
- Matrix Spike
- Field Duplicates
- Laboratory Duplicates
- Laboratory Control Sample
- Detection Limit Results

DISCUSSION

Performance Evaluation Data

Data for performance evaluation samples (PEs) are generated to provide information on the overall accuracy and bias of the analytical method and on laboratory performance. The PE is evaluated to assess the magnitude and direction of the quantitative bias.

A performance evaluation samples was not submitted with this data set.

Preservation and Holding Times

All samples analyzed for TPH were extracted within method-specified holding times.

Initial Calibration Verification

The initial calibration was analyzed at the appropriate frequency. All initial calibration QC acceptance criteria were met.

Continuing Calibration Verification

The continuing calibrations were analyzed at the appropriate frequency. The %Rs were within +/- 10% for all continuing calibration analyses. All QC acceptance criteria were met.

Blanks

No positive detects were reported in the associated method blanks. All QC acceptance criteria for the blanks were acceptable.

Matrix Spike

A MS / MSD was performed on sample 2002433, and was within QC acceptance

limits for %R and RPD for TPH.

Field Duplicate

A few duplicate pair was not submitted with this data set. Field duplicates were submitted at a frequency of one per twenty samples and are tracked on an on-going basis.

Laboratory Control Sample

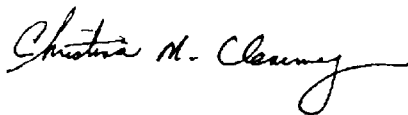
All QC acceptance criteria were met for LCS for TPH.

OVERALL EVALUATION OF THE DATA

The objective of the final evaluation of this data package is to identify the “analytical error” and any “sampling error” associated with the data. The sum of the “analytical error” and the “sampling error” equals the “measurement error.” The end user should use the “measurement error” in conjunction with sampling variability to determine “total error” (total uncertainty) associated with the data. The data in this data package have been qualified as rejected (R) or estimated (J) depending upon the degree of analytical and / or sampling error. Ultimately, the end user should assess data usability in the context of the pre-determined Data Quality Objectives (DQOs) and resultant “total error” of the data.

No data was qualified.

To the best of my knowledge, after thorough review of the attached sampling data and validation information, I believe that the data does show that the Performance Standards identified in Remedial Action Work Plan.



Authorized Pratt & Whitney Representative



Loureiro Engineering Associates, Inc.

To: Brian Cutler / LEA
From: Tina Clemmey / LEA
DV Report Date: 05/31/02

Project Name: Willow Brook Pond PCB Remediation
Sampled Date: 05/24/02

A Tier II data validation was performed on data for four wood samples collected on May 24, 2002 for the Willow Brook Willow Pond PCB Remediation Project at Pratt & Whitney in East Hartford, Connecticut. The samples were collected from locations of the Site designated as WT-CS-11-032, WT-CS-11-035, WT-CS-11-029 and WT-CS-11-055. The samples were analyzed for PCBs by USEPA SW846 Method 8082.

The samples were submitted to Premier Laboratory, LLC in Brooklyn, CT. Premier processed and reported these samples under Project 88UT002-103. The internal laboratory lot number associated with this sample delivery group is E205A64 (batch 15282).

The sample results were assessed according to Region 1, EPA Data Validation Functional Guidelines for Evaluating Environmental Analyses: Pesticides / PCBs, July 1988. Additional guidance and logic was obtained from the Functional Guidelines for Volatile / Semivolatile Data Validation Functional Guidelines, December 1996 when applicable. Technical judgement was also applied where applicable

The following tables have been included in this report: Table 1: Tier II Data

Assessment, Table 2: Samples associated with the sample delivery group (SDG), Table 3: Summary of Data Validation Qualifiers applied to samples as a result of the validation, Table 4: Summary of Qualified Analytical Results.

An explanation of the validation decisions is presented below.

SAMPLES

Samples included in this review are listed in Table 2 of this report.

PCB ANALYSES

Performance Evaluation Data

Data for performance evaluation samples (PEs) are generated to provide information on the overall accuracy and bias of the analytical method and on laboratory performance. The PE is evaluated to assess the magnitude and direction of the quantitative bias. The frequency for performance evaluation samples for this project is one per twenty field samples.

A performance evaluation sample was not submitted with this data set.

Preservation and technical holding times

The validity of the analytical results is evaluated based on the preservation techniques used and the holding time of the sample, as appropriate.

The samples were extracted and analyzed within acceptable holding time. The sample temperature upon receipt was 9.0°C, which was not within the acceptance limit of 4°C +/- 2°C. Results were not qualified based on sample temperature due to the logistics of the sample transport process. Generally, the samples were collected at ambient temperature, placed on ice in a cooler and immediately transferred to a courier for delivery to the laboratory. The trip from the Site to the laboratory was completed in

approximately one hour.

Agreement with the Chain of Custody

Four samples were shipped to Premier Laboratory under chain of custody on 05/24/02. The samples were analyzed for PCBs by SW846 Method 8082. Validation of PCBs is discussed in this report. No discrepancies were noted.

Initial Calibration and Continuing Calibration

Compliance requirements for initial and continuing calibrations are evaluated to ensure that the instruments are capable of producing acceptable qualitative and quantitative data.

Initial calibration curves were performed on GC4. Equal concentrations of a mixture of Aroclors 1016 and 1260 were used. Calibration factors were calculated at five concentrations. All percent relative standard deviations (%RSD) were less than 20%.

Continuing calibration verifications were performed on GC4. Each continuing calibration standard consisted of a mixture of Aroclors 1016 and 1260 and was performed at a single concentration. The percent drift (%D) was less than 15%. QC acceptance criteria were met for the continuing calibration.

Blanks

Blank analyses data is to determine the existence and magnitude of contamination problems resulting from laboratory and / or field activities and to subsequently assess their contribution to measurement error

No detects were reported in the method blank.

Surrogate Compounds

Sample matrix effects and laboratory performance on individual samples are assessed by evaluating surrogate recovery. Poor surrogate recovery can be

an indication of Interfering matrix effects, presence of high concentration target and/or non-target analytes, and poor laboratory performance.

Surrogates tetrachloro-m-xylene and decachlorobiphenyl were spiked into every sample. Surrogates were diluted out in all four field samples due matrix interference. QC acceptance criteria were met for percent recovery (%R) for both surrogates in the method blank and the laboratory control sample. The associated LCS recoveries were within the established control limits.

Matrix Spike / Matrix Spike Duplicate Analyses

Data for matrix spike / matrix spike duplicates were evaluated to determine laboratory precision and method bias for specific sample matrices.

A matrix spike / matrix spike duplicate was performed on sample 2002426 with this data set. Percent recovery and relative percent difference were not determined due to matrix interference. The laboratory reported that the sample contained interfering peaks, which would not allow for accurate integration and quantitation of the matrix spike components. The associated LCS recoveries were within the established control limits.

Laboratory Control Sample

Laboratory control samples are evaluated to assess the internal quality control of the laboratory's analytical method accuracy and method bias.

All QC acceptance criteria were met for percent recovery (%R) for the LCS samples.

Field Duplicate

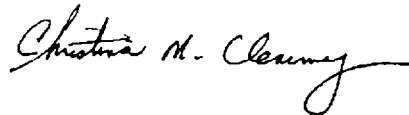
No field duplicates were submitted with this data set.

OVERALL EVALUATION OF THE DATA

The objective of the final evaluation of this data package is to identify the “analytical error” and any “sampling error” associated with the data. The sum of the “analytical error” and the “sampling error” equals the “measurement error.” The end user should use the “measurement error” in conjunction with sampling variability to determine “total error” (total uncertainty) associated with the data. Ultimately, the end user should assess data usability in the context of the pre-determined Data Quality Objectives (DQOs) and resultant “total error” of the data.

All Aroclor data were qualified as estimated (J) since data could not be evaluated for surrogate recovery and / or MS/MSD recovery and RPD due to matrix interference. It should also be noted that detection limits were elevated as a result of the matrix interferences.

To the best of my knowledge, after thorough review of the attached sampling data and validation information, I believe that the data does show that the Performance Standards identified in the Remedial Action Work Plan have been met.

A handwritten signature in black ink, reading "Christina M. Cleary". The signature is fluid and cursive, with a long horizontal stroke at the end.

Authorized Pratt & Whitney Representative



Loureiro Engineering Associates, Inc.

To: Brian Cutler / LEA
From: Tina Clemmey / LEA
DV Report Date: 05/30/02

Project Name: Willow Brook Pond PCB Remediation
Sampled Date: 05/23/02

A Tier II data validation was performed on data for four wipe samples collected on May 23, 2002 for the Willow Brook Willow Pond PCB Remediation Project at Pratt & Whitney in East Hartford, Connecticut. The samples were collected from locations of the Site designated as WT-CS-08-038 through WT-CS-08-041. The samples were analyzed for PCBs by USEPA SW846 Method 8082.

The samples were submitted to Premier Laboratory, LLC in Brooklyn, CT. Premier processed and reported these samples under Project 88UT002-103. The internal laboratory lot number associated with this sample delivery group is E205A69 (batch 15282).

The sample results were assessed according to Region 1, EPA Data Validation Functional Guidelines for Evaluating Environmental Analyses: Pesticides / PCBs, July 1988. Additional guidance and logic was obtained from the Functional Guidelines for Volatile / Semivolatile Data Validation Functional Guidelines, December 1996 when applicable. Technical judgement was also applied where applicable

The following tables have been included in this report: Table 1: Tier II Data

Assessment, Table 2: Samples associated with the sample delivery group (SDG), Table 3: Summary of Data Validation Qualifiers applied to samples as a result of the validation, Table 4: Summary of Qualified Analytical Results.

An explanation of the validation decisions is presented below.

SAMPLES

Samples included in this review are listed in Table 2 of this report.

PCB ANALYSES

Performance Evaluation Data

Data for performance evaluation samples (PEs) are generated to provide information on the overall accuracy and bias of the analytical method and on laboratory performance. The PE is evaluated to assess the magnitude and direction of the quantitative bias. The frequency for performance evaluation samples for this project is one per twenty field samples.

A performance evaluation sample was not submitted with this data set.

Preservation and technical holding times

The validity of the analytical results is evaluated based on the preservation techniques used and the holding time of the sample, as appropriate.

The samples were extracted and analyzed within acceptable holding time. The sample temperature upon receipt was 9.0°C, which was not within the acceptance limit of 4°C +/- 2°C. Results were not qualified based on sample temperature due to the logistics of the sample transport process. In most cases, samples were collected at ambient temperature, placed in a cooler and almost immediately transferred to a courier for delivery to the lab. The trip from the Site to laboratory was generally completed in

less than one hour.

Agreement with the Chain of Custody

Four samples were shipped to Premier Laboratory under chain of custody on 05/23/02. The samples were analyzed for PCBs by SW846 Method 8082. Validation of PCBs is discussed in this report. No discrepancies were noted.

Initial Calibration and Continuing Calibration

Compliance requirements for initial and continuing calibrations are evaluated to ensure that the instruments are capable of producing acceptable qualitative and quantitative data.

Initial calibration curves were performed on GC4. Equal concentrations of a mixture of Aroclors 1016 and 1260 were used. Calibration factors were calculated at five concentrations. All percent relative standard deviations (%RSD) were less than 20%.

Continuing calibration verifications were performed on GC4. Each continuing calibration standard consisted of a mixture of Aroclors 1016 and 1260 and was performed at a single concentration. The percent drift (%D) was less than 15%. QC acceptance criteria were met for the continuing calibration.

Blanks

Blank analyses data is to determine the existence and magnitude of contamination problems resulting from laboratory and / or field activities and to subsequently assess their contribution to measurement error

No detects were reported in the method blank.

Surrogate Compounds

Sample matrix effects and laboratory performance on individual samples are assessed by evaluating surrogate recovery. Poor surrogate recovery can be

an indication of Interfering matrix effects, presence of high concentration target and/or non-target analytes, and poor laboratory performance.

Surrogates tetrachloro-m-xylene and decachlorobiphenyl were spiked into every sample. QC acceptance criteria was met for percent recovery (%R) for both surrogates in all of the field samples, QC samples and blanks analyzed for PCBs.

Matrix Spike / Matrix Spike Duplicate Analyses

Data for matrix spike / matrix spike duplicates were evaluated to determine laboratory precision and method bias for specific sample matrices.

A matrix spike / matrix spike duplicate was not performed on wipe samples.

Laboratory Control Sample

Laboratory control samples are evaluated to assess the internal quality control of the laboratory's analytical method accuracy and method bias.

All QC acceptance criteria were met for percent recovery (%R) for the LCS samples.

Field Duplicate

Field duplicates were not submitted with this data set.

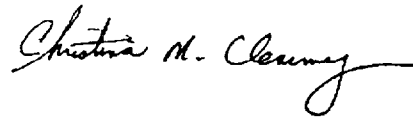
OVERALL EVALUATION OF THE DATA

The objective of the final evaluation of this data package is to identify the “analytical error” and any “sampling error” associated with the data. The sum of the “analytical error” and the “sampling error” equals the “measurement error.” The end user should use the “measurement error” in conjunction with sampling variability to determine “total error” (total uncertainty) associated with the data. Ultimately, the end user

— should assess data usability in the context of the pre-determined Data Quality Objectives (DQOs) and resultant “total error” of the data.

No data were qualified.

To the best of my knowledge, after thorough review of the attached sampling data and validation information, I believe that the data does show that the Performance Standards identified in the Remedial Action Work Plan have been met.



Authorized Pratt & Whitney Representative



Loureiro Engineering Associates, Inc.

To: Brian Cutler / LEA
From: Tina Clemmey / LEA
DV Report Date: 05/29/02

Project Name: Willow Brook Pond PCB Remediation
Sampled Date: 05/23/02

A Tier II data validation was performed on data for two soil samples collected on May 23, 2002 for the Willow Brook Willow Pond PCB Remediation Project at Pratt & Whitney in East Hartford, Connecticut. The samples were collected from locations of the Site designated as WT-CS-08-036 through WT-CS-08-037. The samples were analyzed for PCBs by USEPA SW846 Method 8082.

The samples were submitted to Premier Laboratory, LLC in Brooklyn, CT. Premier processed and reported these samples under Project 88UT002-103. The internal laboratory lot number associated with this sample delivery group is E205988 (batch 15254).

The sample results were assessed according to Region 1, EPA Data Validation Functional Guidelines for Evaluating Environmental Analyses: Pesticides / PCBs, July 1988. Additional guidance and logic was obtained from the Functional Guidelines for Volatile / Semivolatile Data Validation Functional Guidelines, December 1996 when applicable. Technical judgement was also applied where applicable

The following tables have been included in this report: Table 1: Tier II Data

Assessment, Table 2: Samples associated with the sample delivery group (SDG), Table 3: Summary of Data Validation Qualifiers applied to samples as a result of the validation, Table 4: Summary of Qualified Analytical Results.

An explanation of the validation decisions is presented below.

SAMPLES

Samples included in this review are listed in Table 2 of this report.

PCB ANALYSES

Performance Evaluation Data

Data for performance evaluation samples (PEs) are generated to provide information on the overall accuracy and bias of the analytical method and on laboratory performance. The PE is evaluated to assess the magnitude and direction of the quantitative bias. The frequency for performance evaluation samples for this project is one per twenty field samples.

A performance evaluation sample was not submitted with this data set.

Preservation and technical holding times

The validity of the analytical results is evaluated based on the preservation techniques used and the holding time of the sample, as appropriate.

The samples were extracted and analyzed within acceptable holding time. The sample temperature upon receipt was 6.0°C, which was within the acceptance limit of 4°C +/- 2°C.

Agreement with the Chain of Custody

Two samples were shipped to Premier Laboratory under chain of custody on 05/23/02. The samples were analyzed for PCBs by SW846 Method 8082. Validation of PCBs is discussed in this report. No discrepancies were noted.

Initial Calibration and Continuing Calibration

Compliance requirements for initial and continuing calibrations are evaluated to ensure that the instruments are capable of producing acceptable qualitative and quantitative data.

Initial calibration curves were performed on GC4. Equal concentrations of a mixture of Aroclors 1016 and 1260 were used. Calibration factors were calculated at five concentrations. All percent relative standard deviations (%RSD) were less than 20%.

Continuing calibration verifications were performed on GC4. Each continuing calibration standard consisted of a mixture of Aroclors 1016 and 1260 and was performed at a single concentration. The percent drift (%D) was less than 15%. QC acceptance criteria were met for the continuing calibration.

Blanks

Blank analyses data is to determine the existence and magnitude of contamination problems resulting from laboratory and / or field activities and to subsequently assess their contribution to measurement error

No detects were reported in the method blank.

Surrogate Compounds

Sample matrix effects and laboratory performance on individual samples are assessed by evaluating surrogate recovery. Poor surrogate recovery can be an indication of Interfering matrix effects, presence of high concentration target and/or non-target analytes, and poor laboratory performance.

Surrogates tetrachloro-m-xylene and decachlorobiphenyl were spiked into every sample. QC acceptance criteria was met for percent recovery (%R) for both surrogates in all of the field samples, QC samples and blanks analyzed for PCBs.

Matrix Spike / Matrix Spike Duplicate Analyses

Data for matrix spike / matrix spike duplicates were evaluated to determine laboratory precision and method bias for specific sample matrices.

A matrix spike / matrix spike duplicate was performed on sample 2002420 with this data set. Percent recovery and relative percent difference were within acceptance limits. All data were accepted as reported in the unspiked sample.

Laboratory Control Sample

Laboratory control samples are evaluated to assess the internal quality control of the laboratory's analytical method accuracy and method bias.

All QC acceptance criteria were met for percent recovery (%R) for the LCS samples.

Field Duplicate

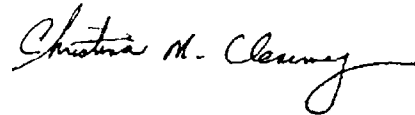
No field duplicates were submitted with this data set.

OVERALL EVALUATION OF THE DATA

The objective of the final evaluation of this data package is to identify the “analytical error” and any “sampling error” associated with the data. The sum of the “analytical error” and the “sampling error” equals the “measurement error.” The end user should use the “measurement error” in conjunction with sampling variability to determine “total error” (total uncertainty) associated with the data. Ultimately, the end user should assess data usability in the context of the pre-determined Data Quality Objectives (DQOs) and resultant “total error” of the data.

No data were qualified.

To the best of my knowledge, after thorough review of the attached sampling data and validation information, I believe that the data does show that the Performance Standards identified in the Remedial Action Work Plan have been met.

A handwritten signature in black ink, reading "Christina M. Cleary". The signature is written in a cursive style with a long horizontal flourish extending to the right.

Authorized Pratt & Whitney Representative



Loureiro Engineering Associates, Inc.

To: Brian Cutler / LEA
From: Tina Clemmey / LEA
DV Report Date: 05/27/02

Project Name: Willow Brook Pond PCB Remediation
Sampled Date: 05/22/02

A Tier II data validation was performed on data for six soil samples and one performance evaluation sample collected on May 22, 2002 for the Willow Brook Willow Pond PCB Remediation Project at Pratt & Whitney in East Hartford, Connecticut. The samples were collected from locations of the Site designated as WT-CS-09-066 through WT-CS-09-071. The sample was analyzed for PCBs by USEPA SW846 Method 8082. Samples were also submitted for "other" parameters. Validation of these parameters is discussed in a separate validation report.

The samples were submitted to Premier Laboratory, LLC in Brooklyn, CT. Premier processed and reported these samples under Project 88UT002-103. The internal laboratory lot number associated with this sample delivery group is E205928 (batch 15236).

The sample results were assessed according to Region 1, EPA Data Validation Functional Guidelines for Evaluating Environmental Analyses: Pesticides / PCBs, July 1988. Additional guidance and logic was obtained from the Functional Guidelines for Volatile / Semivolatile Data Validation Functional Guidelines, December 1996 when applicable. Technical judgement was also applied where applicable

The following tables have been included in this report: Table 1: Tier II Data Assessment, Table 2: Samples associated with the sample delivery group (SDG), Table 3: Summary of Data Validation Qualifiers applied to samples as a result of the validation, Table 4: Summary of Qualified Analytical Results.

An explanation of the validation decisions is presented below.

SAMPLES

Samples included in this review are listed in Table 2 of this report.

PCB ANALYSES

Performance Evaluation Data

Data for performance evaluation samples (PEs) are generated to provide information on the overall accuracy and bias of the analytical method and on laboratory performance. The PE is evaluated to assess the magnitude and direction of the quantitative bias. The frequency for performance evaluation samples for this project is one per twenty field samples.

A double blind aqueous performance evaluation sample (2002414) was submitted with this data set. The PE sample was prepared by Environmental Resource Associates (ERA). The ERA lot number associated with this sample was 0520-02-06.6 Aroclor 1254 was spiked into the sample at a concentration of 5.70 ug/l. The performance acceptance limit was 2.79 - 7.75 ug/l. The laboratory reported a concentration of 5.1 ug/l. QC acceptance criteria were met. Performance data is presented in Attachment 1 of this report.

Preservation and technical holding times

The validity of the analytical results is evaluated based on the preservation techniques used and the holding time of the sample, as appropriate.

The samples were extracted and analyzed within acceptable holding time. The sample temperatures upon receipt were 10°C and 6°C. The acceptance limit for temperature is 4°C +/- 2°C. No qualification was applied based on sample temperature due to the logistics of the sample transport process. Samples were collected at ambient temperature, placed in a cooler on ice and immediately transferred to the courier. The trip from the Site to the laboratory is generally completed in approximately one hour.

Agreement with the Chain of Custody

Six soil samples, a trip blank and six aqueous performance samples were shipped to Premier Laboratory under chain of custody on 05/22/02. The samples were analyzed for PCBs by SW846 Method 8082. Validation of PCBs is discussed in this report. Validation of the “other” parameters are discussed in a separate validation report. No discrepancies were noted.

Initial Calibration and Continuing Calibration

Compliance requirements for initial and continuing calibrations are evaluated to ensure that the instruments are capable of producing acceptable qualitative and quantitative data.

Initial calibration curves were performed on GC4. Equal concentrations of a mixture of Aroclors 1016 and 1260 were used. Calibration factors were calculated at five concentrations. All percent relative standard deviations (%RSD) were less than 20%.

Continuing calibration verifications were performed on GC4. Each continuing calibration standard consisted of a mixture of Aroclors 1016 and 1260 and was performed at a single concentration. The percent drift (%D) was less than 15%. QC acceptance criteria were met for the continuing calibration.

Blanks

Blank analyses data is to determine the existence and magnitude of contamination problems resulting from laboratory and / or field activities and to subsequently assess their contribution to measurement error

No detects were reported in the method blank.

Surrogate Compounds

Sample matrix effects and laboratory performance on individual samples are assessed by evaluating surrogate recovery. Poor surrogate recovery can be an indication of Interfering matrix effects, presence of high concentration target and/or non-target analytes, and poor laboratory performance.

Surrogates tetrachloro-m-xylene and decachlorobiphenyl were spiked into every sample. QC acceptance criteria was met for percent recovery (%R) for both surrogates in all of the field samples, QC samples and blanks analyzed for PCBs. Surrogates were diluted out in samples 2002410, 2002411, and 2442412 due to elevated aroclor concentrations.

Matrix Spike / Matrix Spike Duplicate Analyses

Data for matrix spike / matrix spike duplicates were evaluated to determine laboratory precision and method bias for specific sample matrices.

A matrix spike / matrix spike duplicate was performed on sample 2002408 with this data set. Percent recovery and relative percent difference were within acceptance limits. All data were accepted as reported in the unspiked sample.

Laboratory Control Sample

Laboratory control samples are evaluated to assess the internal quality control of the laboratory's analytical method accuracy and method bias.

All QC acceptance criteria were met for percent recovery (%R) for the LCS samples.

Field Duplicate

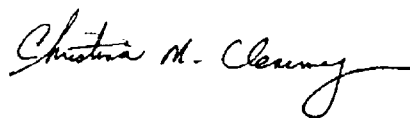
No field duplicates were submitted with this data set.

OVERALL EVALUATION OF THE DATA

The objective of the final evaluation of this data package is to identify the “analytical error” and any “sampling error” associated with the data. The sum of the “analytical error” and the “sampling error” equals the “measurement error.” The end user should use the “measurement error” in conjunction with sampling variability to determine “total error” (total uncertainty) associated with the data. Ultimately, the end user should assess data usability in the context of the pre-determined Data Quality Objectives (DQOs) and resultant “total error” of the data.

No data were qualified.

To the best of my knowledge, after thorough review of the attached sampling data and validation information, I believe that the data does show that the Performance Standards identified in the Remedial Action Work Plan have been met.

A handwritten signature in black ink, reading "Christina M. Cleary". The signature is fluid and cursive, with a long horizontal flourish extending to the right.

Authorized Pratt & Whitney Representative



Loureiro Engineering Associates, Inc.

To: Brian Cutler / LEA
From: Tina Clemmey / LEA
DV Report Date: 06/10/02

Project Name: Willow Brook Pond PCB Remediation
Sampled Date: 05/22/02

A Tier II data validation was performed on data for six soil samples collected on May 22, 2002 for the Willow Brook Willow Pond PCB Remediation Project at Pratt & Whitney in East Hartford, Connecticut. A trip blank (2002413) and double blind aqueous performance samples (2002415 through 2002419) were included with this sample delivery group. The samples discussed in this validation memorandum were analyzed for VOCs by SW846 Method 8260B, SVOCs by SW846 Method 8270C, TPH by USEPA 418.1, Metals by SW846 Method 6010B and Cyanide by SW846 Method 9012. These parameters are herein referred to as the "other parameters." Validation for the samples submitted for PCBs by SW846 Method 8082 are presented in a separate validation report.

The samples were submitted to Premier Laboratory, LLC in Brooklyn, CT. Premier processed and reported these samples under Project 88UT103. The internal laboratory lot number associated with this sample delivery group is E205928.

The sample results were assessed according to Region 1, EPA Data Validation Functional Guidelines for Evaluating Environmental Analyses: Organic Data Review (December 1996), Pesticides / PCBs Data Review (July 1988) and Inorganic Data Review (February 1989) as appropriate. Chemistry parameters were validated using the same logic as presented in Region 1, EPA validation guidelines for other

parameters where applicable. Since there is no official guidance at this time for validating general chemistry analyses. Technical judgement was applied when applicable and necessary.

The following tables have been included in this report: Table I: Summary of Tier II Data Assessment, Table II Samples associated with the sample delivery group (SDG), Table III: Summary of Data Validation Qualifiers applied to samples as a result of the validation, and Table IV: Summary of Qualified Analytical Results.

An explanation of the validation decisions is presented below.

SAMPLES

Samples included in this review are listed in Table II of this report.

ORGANIC DATA REVIEW

Organic data review includes review of analyses for volatile organic compounds (VOCs) and semivolatile organic compounds (SVOCs).

REVIEW OF ELEMENTS

Sample data were reviewed for the following parameters:

- Performance Evaluation Sample Data
- Surrogate Compounds
- Agreement with Chain-of-Custody
- Internal Standards
- Preservation and Holding Time
- Matrix Spike / Matrix Spike Duplicate

- GC/MS Instrument Performance Check
- Laboratory Control Sample
- Initial and Continuing Calibration
- Practical Quantitation Limits
- Blanks
- Tentatively Identified compounds

DISCUSSION

Agreement of Analyses with Chain of Custody

Sample reports are checked to verify that the reported results corresponded to analytical requests as detailed on the chain-of-custody record. The chain-of-custody form is reviewed for accuracy and completeness.

Samples were collected on May 22, 2002. The samples were shipped and received by Premier Laboratory, LLC under chain-of-custody on May 22, 2002. During validation, the chain-of-custody form was reviewed for accuracy and completeness. No discrepancies were noted.

VOLATILE ORGANIC ANALYSES

Performance Evaluation Data

Data for performance evaluation samples (PEs) are generated to provide information on the overall accuracy and bias of the analytical method and on laboratory performance. The PE is evaluated to assess the magnitude and direction of the quantitative bias.

A double blind aqueous performance evaluation sample was submitted with this data set. The PE sample was prepared by Environmental Resource Associates in Arvada,

Colorado. The lot number associated with the VOC PE was 0520-02-06.2. Seventeen VOC compounds were spiked into the PE sample. All reported concentrations were within the vendor certified acceptance limits except for 1,1,1-trichloroethane, which was above the upper acceptance limit. Since no detects were reported for 1,1,1-TCA in the associated samples, all non-detects were accepted without qualification based on high % recovery.

Preservation and technical holding times

The validity of the analytical results is evaluated based on the preservation techniques used and the holding time of the sample, as appropriate.

The sample cooler temperature recorded by the laboratory was 6.0°C and 10.0°C. The QC acceptance limit for sample temperature is 2°C – 6°C. Samples were not qualified based on sample temperature since the samples were collected at ambient temperature, placed on ice in a cooler and transferred to a courier for transport to the laboratory within the same day. The trip from the site to the laboratory was generally completed within an hour. It should also be noted that all VOC soil samples were preserved on site in methanol according to SW846 Method 5035. All samples were extracted and analyzed within method specified holding times.

GC/MS Instrument Performance Check

Gas chromatograph / mass spectrometer (GC/MS) instrument performance (tuning) checks are evaluated to ensure proper mass calibration and resolution, identification and to some degree sensitivity.

All ion abundance acceptance criteria specified in the methods for VOCs were met for each 12-hour period that samples were analyzed.

Initial and Continuing Calibration

Compliance requirements for initial and continuing calibrations are evaluated

to ensure that the instruments are capable of producing acceptable qualitative and quantitative data.

All VOC target compounds were within the QC acceptance criteria for the initial and continuing calibrations.

Blanks

Blank analyses data is to determine the existence and magnitude of contamination problems resulting from laboratory and / or field activities and to subsequently assess their contribution to measurement error

A trip blank (2002413) and the method blank were evaluated for contamination for VOCs. No detects were reported.

Surrogate Compounds

Sample matrix effects and laboratory performance on individual samples are assessed by evaluating surrogate recovery. Poor surrogate recovery can be an indication of Interfering matrix effects, presence of high concentration target and/or non-target analytes, and poor laboratory performance.

QC acceptance criteria was met for percent recovery (%R) for surrogates in all of the field samples, QC samples and blanks analyzed for VOCs. No qualifications were made on the unspiked sample.

Internal Standards

Instrument performance, stability and laboratory precision are evaluated by assessing internal standard area count recovery and retention time drift.

All VOC data for the QC acceptance criteria were met for internal standard (IS) area

counts and retention times.

Matrix Spike / Matrix Spike Duplicate Analyses

Data for matrix spike / matrix spike duplicates were evaluated to determine laboratory precision and method bias for specific sample matrices.

The laboratory performed a VOC matrix spike / matrix spike duplicate (MS/MSD) analyses on LEA soil sample 2002408. All data were within acceptance limits for % recovery (%R) and Relative Percent Difference (RPD) for the MS and MSD analyses with the exception of chloromethane. The % R for chloromethane was slightly above the upper acceptance limit for both the MS and the MSD analyses. Since chloromethane was not reported in the unspiked sample, the non-detect result was accepted without qualification.

Laboratory Control Sample

Laboratory control samples are evaluated to assess the internal quality control of the laboratory's analytical method accuracy and method bias.

All data met the QC acceptance criteria for percent recovery for the VOC laboratory control sample(s).

Field Duplicate

A field duplicate pair was not submitted with this data set.

Tentatively Identified Compounds

No tentatively identified compounds were reported.

SEMIVOLATILE ORGANIC ANALYSES

Performance Evaluation Data

Data for performance evaluation samples (PEs) are generated to provide information on the overall accuracy and bias of the analytical method and on laboratory performance. The PE is evaluated to assess the magnitude and direction of the quantitative bias.

A double blind aqueous performance evaluation sample was submitted with this data set. The PE sample was prepared by Environmental Resource Associates in Arvada, Colorado. The lot number associated with the SVOC PE was 0520-02-06.1. Forty SVOC compounds were spiked into the PE sample. All reported concentrations were within the vendor certified acceptance limits. It should be noted that the laboratory inadvertently reported all SVOCs at approximately 1000 X higher than the vendor-certified results. After the data validator contacted that laboratory, the laboratory reviewed the data and found a transcription / calculation error in the extraction volume. The data were resubmitted in hardcopy and electronic format. This issue did not impact data usability.

Preservation and technical holding times

The validity of the analytical results is evaluated based on the preservation techniques used and the holding time of the sample, as appropriate.

The sample cooler temperature recorded by the laboratory was 6.0°C and 10.0°C. The QC acceptance limit for sample temperature is 2°C – 6°C. Samples were not qualified based on sample temperature since the samples were collected at ambient temperature, placed on ice in a cooler and transferred to a courier for transport to the laboratory within the same day. The trip from the site to the laboratory was generally completed within an hour. All samples were extracted and analyzed within method specified holding times.

GC/MS Instrument Performance Check

Gas chromatograph / mass spectrometer (GC/MS) instrument performance (tuning) checks are evaluated to ensure proper mass calibration and resolution, identification and to some degree sensitivity.

All ion abundance acceptance criteria specified in the methods SVOCs were met for each 12-hour period that samples were analyzed.

Initial and Continuing Calibration

Compliance requirements for initial and continuing calibrations are evaluated to ensure that the instruments are capable of producing acceptable qualitative and quantitative data.

All SVOC target compounds were within the QC acceptance criteria for the initial and continuing calibrations.

Blanks

Blank analyses data is to determine the existence and magnitude of contamination problems resulting from laboratory and / or field activities and to subsequently assess their contribution to measurement error

The method blank was evaluated for contamination for SVOCs. No detects were reported.

Surrogate Compounds

Sample matrix effects and laboratory performance on individual samples are assessed by evaluating surrogate recovery. Poor surrogate recovery can be an indication of Interfering matrix effects, presence of high concentration target and/or non-target analytes, and poor laboratory performance.

QC acceptance criteria was met for percent recovery (%R) for surrogates in all of the field samples, QC samples and blanks analyzed for SVOCs. The surrogate 2,4,6-tribromophenol was diluted out in sample 2002412 due to matrix interference resulting from the presence of a large fuel pattern. Detection limits were elevated for the sample.

Internal Standards

Instrument performance, stability and laboratory precision are evaluated by assessing internal standard area count recovery and retention time drift.

All SVOC data for the QC acceptance criteria were met for internal standard (IS) area counts and retention times.

Matrix Spike / Matrix Spike Duplicate Analyses

Data for matrix spike / matrix spike duplicates were evaluated to determine laboratory precision and method bias for specific sample matrices.

The laboratory performed an SVOC matrix spike / matrix spike duplicate (MS/MSD) analyses on LEA soil sample 2002408. All SVOC spiking compounds were within acceptance limits for %R and RPD.

Laboratory Control Sample

Laboratory control samples are evaluated to assess the internal quality control of the laboratory's analytical method accuracy and method bias.

All data met the QC acceptance criteria for percent recovery for the SVOC laboratory control samples.

Field Duplicate

A field duplicate pair was not submitted with this data set.

Tentatively Identified Compounds

No tentatively identified compounds were reported.

INORGANIC DATA REVIEW

REVIEW OF ELEMENTS

Sample data were reviewed for the following parameters:

- Performance Evaluation Data
- Agreement with Chain of Custody
- Preservation and Technical Holding Times
- Calibration Verification
- Blanks
- ICP Interference Check Sample
- Matrix Spike
- Field Duplicates
- Laboratory Duplicates
- Furnace AA / Post Digestion Spike
- Laboratory Control Sample
- Serial Dilution Results
- Detection Limit Results

DISCUSSION

Performance Evaluation Data

Data for performance evaluation samples (PEs) are generated to provide information on the overall accuracy and bias of the analytical method and on laboratory performance. The PE is evaluated to assess the magnitude and direction of the quantitative bias.

A double blind aqueous performance evaluation sample was submitted with this data set. The PE sample was prepared by Environmental Resource Associates in Arvada, Colorado. The lot number associated with the Metals PE was 0520-02-06.4. Ten Metals compounds were spiked into the PE sample. All results were within the vendor certified acceptance limits.

Preservation and Holding Times

All samples were properly preserved and analyzed within method-specified holding times.

Calibration Verification

Compliance requirements are evaluated to ensure that the instrument is capable of producing acceptable quantitative data.

All initial calibration verification (ICV) and continuing calibration verification (CCV) for all metals were analyzed at the appropriate frequency and were within control limits

Blanks

Blank analyses were assessed to determine the existence and magnitude of contamination problems.

All analytes were within acceptance limit for percent recovery for the lab fortified blank analysis. No detects were reported in the method blank.

Matrix Spike / Matrix Spike Duplicate

The matrix spike sample was evaluated to provide information about the effect of the sample matrix on the digestion and measurement methodology.

A MS/MSD was performed on sample 2002408. All analytes were within acceptance limits for % recovery (%R) and Relative Percent Difference (RPD) for the MS and MSD analyses.

Laboratory Duplicates

All analytes were within acceptance limits for Relative Percent Difference for the laboratory duplicate analyses. Criteria for acceptable duplicate precision is less than 35% RPD for sample results that are greater than five times the CRDL and +/- 2X CRDL for sample results that are less than the five times the CRDL.

Field Duplicates

Field duplicates were assessed to determine overall precision (i.e. field and laboratory precision).

A field duplicate pair was not submitted with this data set.

Laboratory Control Sample

The laboratory control sample is evaluated to assess the efficiency of the digestion procedure.

All data were within the QC acceptance criteria for LCS percent recovery (%R), with the exception of Arsenic and Lead, which were outside the QC acceptance limits (bias low). All affected data were qualified accordingly.

ICP Interference Check Sample

All results were within QC acceptance limits for % recovery for the ICP Interference Check sample.

GENERAL CHEMISTRY DATA REVIEW

General Chemistry data review includes review of analyses for Total Petroleum Hydrocarbons (TPH) and Cyanide. There are currently no Region 1 functional guidelines for data validation of general chemistry parameters. Therefore, general chemistry data are evaluated based upon the QC requirements specified in the method by which they were analyzed.

REVIEW OF ELEMENTS

Sample data were reviewed for the following parameters:

- Performance Evaluation Sample Data
- Agreement with Chain of Custody
- Preservation and Holding Time
- Initial Calibration Verification
- Continuing Calibration Verification
- Blanks
- Matrix Spike
- Field Duplicates
- Laboratory Duplicates
- Laboratory Control Sample
- Detection Limit Results

DISCUSSION

Performance Evaluation Data

Data for performance evaluation samples (PEs) are generated to provide information on the overall accuracy and bias of the analytical method and on laboratory performance. The PE is evaluated to assess the magnitude and direction of the quantitative bias.

A double blind aqueous performance evaluation sample was submitted with this data set. The PE sample was prepared by Environmental Resource Associates in Arvada,

Colorado. The lot number associated with the TPH PE was 0520-02-06.3 and for the Cyanide PE it was 0520-02-06.5. The results were within the vendor certified acceptance limits for both PE samples.

Preservation and Holding Times

All samples analyzed for TPH and cyanide were extracted within method-specified holding times.

Initial Calibration Verification

The initial calibrations were analyzed at the appropriate frequency. The correlation coefficient for the initial calibration curve for TPH was greater than 0.9950. The %RSD was less than 20%.

All initial calibration QC acceptance criteria were met for Cyanide.

Continuing Calibration Verification

The continuing calibrations were analyzed at the appropriate frequency. The %D was below 15% for the continuing calibration analyses for TPH. All QC acceptance criteria were met for continuing calibrations for cyanide.

Blanks

No detects were reported in the associated method blanks for TPH and cyanide. All QC acceptance criteria for the blanks were acceptable

Matrix Spike

The MS / MSD was performed on sample 2002408. All data were within QC acceptance limits for TPH and cyanide.

Field Duplicate

A field duplicate pair was not submitted with this data set.

Laboratory Duplicate

Laboratory precision was demonstrated through laboratory duplicate analysis. All sample duplicate results were within QC acceptance limits for duplicate RPD.

Laboratory Control Sample

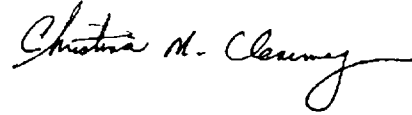
All QC acceptance criteria were met for LCS for TPH and cyanide.

OVERALL EVALUATION OF THE DATA

The objective of the final evaluation of this data package is to identify the “analytical error” and any “sampling error” associated with the data. The sum of the “analytical error” and the “sampling error” equals the “measurement error.” The end user should use the “measurement error” in conjunction with sampling variability to determine “total error” (total uncertainty) associated with the data. The data in this data package have been qualified as rejected (R) or estimated (J) depending upon the degree of analytical and / or sampling error. Ultimately, the end user should assess data usability in the context of the pre-determined Data Quality Objectives (DQOs) and resultant “total error” of the data.

No data were qualified.

To the best of my knowledge, after thorough review of the attached sampling data and validation information, I believe that the data does show that the Performance Standards identified in Remedial Action Work Plan have been met.

A handwritten signature in black ink, reading "Christina M. Cleary". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

Authorized Pratt & Whitney Representative



Loureiro Engineering Associates, Inc.

To: Brian Cutler / LEA
From: Tina Clemmey / LEA
DV Report Date: 05/23/02

Project Name: Willow Brook Pond PCB Remediation
Sampled Date: 05/20/02

A Tier II data validation was performed on data for one soil samples collected on May 20, 2002 for the Willow Brook Willow Pond PCB Remediation Project at Pratt & Whitney in East Hartford, Connecticut. The sample was collected from a location of the Site designated as WT-CS-08-035. The sample was analyzed for PCBs by USEPA SW846 Method 8082.

The samples were submitted to Premier Laboratory, LLC in Brooklyn, CT. Premier processed and reported these samples under Project 88UT002-103. The internal laboratory lot number associated with this sample delivery group is E205856 (batch 15205).

The sample results were assessed according to Region 1, EPA Data Validation Functional Guidelines for Evaluating Environmental Analyses: Pesticides / PCBs, July 1988. Additional guidance and logic was obtained from the Functional Guidelines for Volatile / Semivolatile Data Validation Functional Guidelines, December 1996 when applicable. Technical judgement was also applied where applicable

The following tables have been included in this report: Table 1: Tier II Data

Assessment, Table 2: Samples associated with the sample delivery group (SDG), Table 3: Summary of Data Validation Qualifiers applied to samples as a result of the validation, Table 4: Summary of Qualified Analytical Results.

An explanation of the validation decisions is presented below.

SAMPLES

Samples included in this review are listed in Table 2 of this report.

PCB ANALYSES

Performance Evaluation Data

Data for performance evaluation samples (PEs) are generated to provide information on the overall accuracy and bias of the analytical method and on laboratory performance. The PE is evaluated to assess the magnitude and direction of the quantitative bias. The frequency for performance evaluation samples for this project is one per twenty field samples.

A performance evaluation sample was not submitted with this data set.

Preservation and technical holding times

The validity of the analytical results is evaluated based on the preservation techniques used and the holding time of the sample, as appropriate.

The samples were extracted and analyzed within acceptable holding time. The sample temperature upon receipt was 5.0°C, which was within the acceptance limit of 4°C +/- 2°C.

Agreement with the Chain of Custody

One sample was shipped to Premier Laboratory under chain of custody on 05/21/02. The samples were analyzed for PCBs by SW846 Method 8082. Validation of PCBs is discussed in this report. No discrepancies were noted.

Initial Calibration and Continuing Calibration

Compliance requirements for initial and continuing calibrations are evaluated to ensure that the instruments are capable of producing acceptable qualitative and quantitative data.

Initial calibration curves were performed on GC4. Equal concentrations of a mixture of Aroclors 1016 and 1260 were used. Calibration factors were calculated at five concentrations. All percent relative standard deviations (%RSD) were less than 20%.

Continuing calibration verifications were performed on GC4. Each continuing calibration standard consisted of a mixture of Aroclors 1016 and 1260 and was performed at a single concentration. The percent drift (%D) was less than 15%. QC acceptance criteria were met for the continuing calibration.

Blanks

Blank analyses data is to determine the existence and magnitude of contamination problems resulting from laboratory and / or field activities and to subsequently assess their contribution to measurement error

No detects were reported in the method blank.

Surrogate Compounds

Sample matrix effects and laboratory performance on individual samples are assessed by evaluating surrogate recovery. Poor surrogate recovery can be an indication of Interfering matrix effects, presence of high concentration target and/or non-target analytes, and poor laboratory performance.

Surrogates tetrachloro-m-xylene and decachlorobiphenyl were spiked into every sample. QC acceptance criteria was met for percent recovery (%R) for both surrogates in all of the field samples, QC samples and blanks analyzed for PCBs.

Matrix Spike / Matrix Spike Duplicate Analyses

Data for matrix spike / matrix spike duplicates were evaluated to determine laboratory precision and method bias for specific sample matrices.

A matrix spike / matrix spike duplicate was performed on sample 2002406 with this data set. Percent recovery and relative percent difference were within acceptance limits. All data were accepted as reported in the unspiked sample.

Laboratory Control Sample

Laboratory control samples are evaluated to assess the internal quality control of the laboratory's analytical method accuracy and method bias.

All QC acceptance criteria were met for percent recovery (%R) for the LCS samples.

Field Duplicate

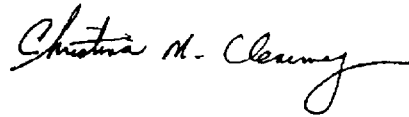
No field duplicates were submitted with this data set.

OVERALL EVALUATION OF THE DATA

The objective of the final evaluation of this data package is to identify the “analytical error” and any “sampling error” associated with the data. The sum of the “analytical error” and the “sampling error” equals the “measurement error.” The end user should use the “measurement error” in conjunction with sampling variability to determine “total error” (total uncertainty) associated with the data. Ultimately, the end user should assess data usability in the context of the pre-determined Data Quality Objectives (DQOs) and resultant “total error” of the data.

No data were qualified.

To the best of my knowledge, after thorough review of the attached sampling data and validation information, I believe that the data does show that the Performance Standards identified in the Remedial Action Work Plan have been met.

A handwritten signature in black ink, reading "Christina M. Cleary". The signature is fluid and cursive, with a long horizontal stroke at the end.

Authorized Pratt & Whitney Representative



Loureiro Engineering Associates, Inc.

To: Brian Cutler / LEA
From: Tina Clemmey / LEA
DV Report Date: 05/22/02

Project Name: Willow Brook Pond PCB Remediation
Sampled Date: 05/17/02

A Tier II data validation was performed on data for one soil samples collected on May 17, 2002 for the Willow Brook Willow Pond PCB Remediation Project at Pratt & Whitney in East Hartford, Connecticut. The sample was collected from a location of the Site designated as WT-CS-09-065. The sample was analyzed for PCBs by USEPA SW846 Method 8082.

The samples were submitted to Premier Laboratory, LLC in Brooklyn, CT. Premier processed and reported these samples under Project 88UT002-103. The internal laboratory lot number associated with this sample delivery group is E205795 (batch 15181).

The sample results were assessed according to Region 1, EPA Data Validation Functional Guidelines for Evaluating Environmental Analyses: Pesticides / PCBs, July 1988. Additional guidance and logic was obtained from the Functional Guidelines for Volatile / Semivolatile Data Validation Functional Guidelines, December 1996 when applicable. Technical judgement was also applied where applicable

The following tables have been included in this report: Table 1: Tier II Data

Assessment, Table 2: Samples associated with the sample delivery group (SDG), Table 3: Summary of Data Validation Qualifiers applied to samples as a result of the validation, Table 4: Summary of Qualified Analytical Results.

An explanation of the validation decisions is presented below.

SAMPLES

Samples included in this review are listed in Table 2 of this report.

PCB ANALYSES

Performance Evaluation Data

Data for performance evaluation samples (PEs) are generated to provide information on the overall accuracy and bias of the analytical method and on laboratory performance. The PE is evaluated to assess the magnitude and direction of the quantitative bias. The frequency for performance evaluation samples for this project is one per twenty field samples.

A performance evaluation sample was not submitted with this data set.

Preservation and technical holding times

The validity of the analytical results is evaluated based on the preservation techniques used and the holding time of the sample, as appropriate.

The samples were extracted and analyzed within acceptable holding time. The sample temperature upon receipt was 3.0°C, which was within the acceptance limit of 4°C +/- 2°C.

Agreement with the Chain of Custody

One sample was shipped to Premier Laboratory under chain of custody on 05/20/02. The samples were analyzed for PCBs by SW846 Method 8082. Validation of PCBs is discussed in this report. No discrepancies were noted.

Initial Calibration and Continuing Calibration

Compliance requirements for initial and continuing calibrations are evaluated to ensure that the instruments are capable of producing acceptable qualitative and quantitative data.

Initial calibration curves were performed on GC4. Equal concentrations of a mixture of Aroclors 1016 and 1260 were used. Calibration factors were calculated at five concentrations. All percent relative standard deviations (%RSD) were less than 20%.

Continuing calibration verifications were performed on GC4. Each continuing calibration standard consisted of a mixture of Aroclors 1016 and 1260 and was performed at a single concentration. The percent drift (%D) was less than 15%. QC acceptance criteria were met for the continuing calibration.

Blanks

Blank analyses data is to determine the existence and magnitude of contamination problems resulting from laboratory and / or field activities and to subsequently assess their contribution to measurement error

No detects were reported in the method blank.

Surrogate Compounds

Sample matrix effects and laboratory performance on individual samples are assessed by evaluating surrogate recovery. Poor surrogate recovery can be an indication of Interfering matrix effects, presence of high concentration target and/or non-target analytes, and poor laboratory performance.

Surrogates tetrachloro-m-xylene and decachlorobiphenyl were spiked into every sample. QC acceptance criteria was met for percent recovery (%R) for both surrogates in all of the field samples, QC samples and blanks analyzed for PCBs.

Matrix Spike / Matrix Spike Duplicate Analyses

Data for matrix spike / matrix spike duplicates were evaluated to determine laboratory precision and method bias for specific sample matrices.

A matrix spike / matrix spike duplicate was performed on sample 2002405 with this data set. Percent recovery and relative percent difference were within acceptance limits. All data were accepted as reported in the unspiked sample.

Laboratory Control Sample

Laboratory control samples are evaluated to assess the internal quality control of the laboratory's analytical method accuracy and method bias.

All QC acceptance criteria were met for percent recovery (%R) for the LCS samples.

Field Duplicate


No field duplicates were submitted with this data set.

OVERALL EVALUATION OF THE DATA

The objective of the final evaluation of this data package is to identify the “analytical error” and any “sampling error” associated with the data. The sum of the “analytical error” and the “sampling error” equals the “measurement error.” The end user should use the “measurement error” in conjunction with sampling variability to determine “total error” (total uncertainty) associated with the data. Ultimately, the end user should assess data usability in the context of the pre-determined Data Quality Objectives (DQOs) and resultant “total error” of the data.

No data were qualified.

To the best of my knowledge, after thorough review of the attached sampling data and validation information, I believe that the data does show that the Performance Standards identified in the Remedial Action Work Plan have been met.

A handwritten signature in black ink, reading "Christina M. Cleary". The signature is written in a cursive style with a long horizontal flourish at the end.

Authorized Pratt & Whitney Representative



Loureiro Engineering Associates, Inc.

To: Brian Cutler / LEA
From: Tina Clemmey / LEA
DV Report Date: 04/26/02

Project Name: Willow Brook Pond PCB Remediation
Sampled Date: 04/24/02

A Tier II data validation was performed on data for four soil samples collected on April 24, 2002 for the Willow Brook Willow Pond PCB Remediation Project at Pratt & Whitney in East Hartford, Connecticut. The samples were collected from locations of the Site designated as WT-CS-07-006 through WT-CS-07-009. All samples were analyzed for PCBs by USEPA SW846 Method 8082.

The sample was submitted to Premier Laboratory, LLC in Brooklyn, CT. Premier processed and reported this sample under Project 88UT002-103. The internal laboratory lot number associated with this sample delivery group is E204946 (batch 14760).

The sample results were assessed according to Region 1, EPA Data Validation Functional Guidelines for Evaluating Environmental Analyses: Pesticides / PCBs, July 1988. Additional guidance and logic was obtained from the Functional Guidelines for Volatile / Semivolatile Data Validation Functional Guidelines, December 1996 when applicable. Technical judgement was also applied where applicable

The following tables have been included in this report: Table 1: Tier II Data

Assessment, Table 2: Samples associated with the sample delivery group (SDG), Table 3: Summary of Data Validation Qualifiers applied to samples as a result of the validation, Table 4: Summary of Qualified Analytical Results.

An explanation of the validation decisions is presented below.

SAMPLES

Samples included in this review are listed in Table 2 of this report.

PCB ANALYSES

Performance Evaluation Data

Data for performance evaluation samples (PEs) are generated to provide information on the overall accuracy and bias of the analytical method and on laboratory performance. The PE is evaluated to assess the magnitude and direction of the quantitative bias. The frequency for performance evaluation samples for this project is one per twenty field samples.

A double blind aqueous performance evaluation sample was not submitted with this data set.

Preservation and technical holding times

The validity of the analytical results is evaluated based on the preservation techniques used and the holding time of the sample, as appropriate.

The samples were extracted and analyzed within acceptable holding time. The sample temperature upon receipt was 5°C, which was within the acceptance limit of 4°C +/- 2°C. No qualification is applied based on sample temperature due to the logistics of the sample transport process. Samples were collected at ambient temperature, placed in a cooler on ice and immediately transferred to the courier. The trip from the Site to

the laboratory is generally completed in approximately one hour.

Agreement with the Chain of Custody

The sample was shipped to Premier Laboratory under chain of custody on 04/24/02. The laboratory received the sample on 04/24/02. The sample was analyzed for PCBs by SW846 Method 8082. Validation of PCBs is discussed in this report. No discrepancies were noted.

Initial Calibration and Continuing Calibration

Compliance requirements for initial and continuing calibrations are evaluated to ensure that the instruments are capable of producing acceptable qualitative and quantitative data.

Initial calibration curves were performed on GC4. Equal concentrations of a mixture of Aroclors 1016 and 1260 were used. Calibration factors were calculated at five concentrations. All percent relative standard deviations (%RSD) were less than 20%.

Continuing calibration verifications were performed on GC4. Each continuing calibration standard consisted of a mixture of Aroclors 1016 and 1260 and was performed at a single concentration. The percent drift (%D) was less than 15%. QC acceptance criteria were met for the continuing calibration.

Blanks

Blank analyses data is to determine the existence and magnitude of contamination problems resulting from laboratory and / or field activities and to subsequently assess their contribution to measurement error

No detects were reported in the method blank.

Surrogate Compounds

Sample matrix effects and laboratory performance on individual samples are

assessed by evaluating surrogate recovery. Poor surrogate recovery can be an indication of Interfering matrix effects, presence of high concentration target and/or non-target analytes, and poor laboratory performance.

Surrogates tetrachloro-m-xylene and decachlorobiphenyl were spiked into every sample. Surrogates were within acceptance limits for other all field samples, QC samples and blanks analyzed for PCBs. It should be noted that surrogates were not evaluated for sample 2002404 because they were diluted out due to elevated concentrations of Aroclor 1254 (22000 ug/kg).

Matrix Spike / Matrix Spike Duplicate Analyses

Data for matrix spike / matrix spike duplicates were evaluated to determine laboratory precision and method bias for specific sample matrices.

The laboratory performed a PCB matrix spike / matrix spike duplicate (MS/MSD) analyses on LEA soil sample 2002401. Aroclor 1254 was spiked into the MS and MSD samples. Percent recoveries and RPD were within acceptance limits.

Laboratory Control Sample

Laboratory control samples are evaluated to assess the internal quality control of the laboratory's analytical method accuracy and method bias.

All QC acceptance criteria were met for percent recovery (%R) for the LCS sample.

Field Duplicate

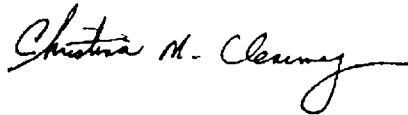
A field duplicate pair was not submitted with this data set.

OVERALL EVALUATION OF THE DATA

The objective of the final evaluation of this data package is to identify the “analytical error” and any “sampling error” associated with the data. The sum of the “analytical error” and the “sampling error” equals the “measurement error.” The end user should use the “measurement error” in conjunction with sampling variability to determine “total error” (total uncertainty) associated with the data. Ultimately, the end user should assess data usability in the context of the pre-determined Data Quality Objectives (DQOs) and resultant “total error” of the data.

No qualifiers were added to this data set.

To the best of my knowledge, after thorough review of the attached sampling data and validation information, I believe that the data does show that the Performance Standards identified in the Remedial Action Work Plan have been met.

A handwritten signature in black ink, reading "Christina M. Cleary". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

Authorized Pratt & Whitney Representative



Loureiro Engineering Associates, Inc.

To: Brian Cutler / LEA
From: Tina Clemmey / LEA
DV Report Date: 04/22/02

Project Name: Willow Brook Pond PCB Remediation
Sampled Date: 04/17/02

A Tier II data validation was performed on data for eleven soil samples collected on April 17, 2002 for the Willow Brook Willow Pond PCB Remediation Project at Pratt & Whitney in East Hartford, Connecticut. The samples were collected from locations of the Site designated as WT-CS-07-001 through WT-CS-07-005, and WT-CS-04-117 through WT-CS-04-112. All samples were analyzed for PCBs by USEPA SW846 Method 8082.

The sample was submitted to Premier Laboratory, LLC in Brooklyn, CT. Premier processed and reported this sample under Project 88UT002-103. The internal laboratory lot number associated with this sample delivery group is E204704 (batch 14615).

The sample results were assessed according to Region 1, EPA Data Validation Functional Guidelines for Evaluating Environmental Analyses: Pesticides / PCBs, July 1988. Additional guidance and logic was obtained from the Functional Guidelines for Volatile / Semivolatile Data Validation Functional Guidelines, December 1996 when applicable. Technical judgement was also applied where applicable

The following tables have been included in this report: Table 1: Tier II Data Assessment, Table 2: Samples associated with the sample delivery group (SDG), Table 3: Summary of Data Validation Qualifiers applied to samples as a result of the validation, Table 4: Summary of Qualified Analytical Results.

An explanation of the validation decisions is presented below.

SAMPLES

Samples included in this review are listed in Table 2 of this report.

PCB ANALYSES

Performance Evaluation Data

Data for performance evaluation samples (PEs) are generated to provide information on the overall accuracy and bias of the analytical method and on laboratory performance. The PE is evaluated to assess the magnitude and direction of the quantitative bias. The frequency for performance evaluation samples for this project is one per twenty field samples.

A double blind aqueous performance evaluation sample was not submitted with this data set.

Preservation and technical holding times

The validity of the analytical results is evaluated based on the preservation techniques used and the holding time of the sample, as appropriate.

The samples were extracted and analyzed within acceptable holding time. The sample temperature upon receipt was 17°C, which was not within the acceptance limit of 4°C +/- 2°C. No qualification is applied based on sample temperature due to the logistics of the sample transport process. Samples were collected at ambient temperature,

placed in a cooler on ice and immediately transferred to the courier. The trip from the Site to the laboratory is generally completed in approximately one hour.

Agreement with the Chain of Custody

The sample was shipped to Premier Laboratory under chain of custody on 04/17/02. The laboratory received the sample on 04/17/02. The sample was analyzed for PCBs by SW846 Method 8082. Validation of PCBs is discussed in this report. No discrepancies were noted.

Initial Calibration and Continuing Calibration

Compliance requirements for initial and continuing calibrations are evaluated to ensure that the instruments are capable of producing acceptable qualitative and quantitative data.

Initial calibration curves were performed on GC4. Equal concentrations of a mixture of Aroclors 1016 and 1260 were used. Calibration factors were calculated at five concentrations. All percent relative standard deviations (%RSD) were less than 20%.

Continuing calibration verifications were performed on GC4. Each continuing calibration standard consisted of a mixture of Aroclors 1016 and 1260 and was performed at a single concentration. The percent drift (%D) was less than 15%. QC acceptance criteria were met for the continuing calibration.

Blanks

Blank analyses data is to determine the existence and magnitude of contamination problems resulting from laboratory and / or field activities and to subsequently assess their contribution to measurement error

No detects were reported in the method blank.

Surrogate Compounds

Sample matrix effects and laboratory performance on individual samples are assessed by evaluating surrogate recovery. Poor surrogate recovery can be an indication of Interfering matrix effects, presence of high concentration target and/or non-target analytes, and poor laboratory performance.

Surrogates tetrachloro-m-xylene and decachlorobiphenyl were spiked into every sample. QC acceptance criteria could not be evaluated for percent recovery (%R) for both surrogates in field sample 2002388 because the surrogates were diluted out due to elevated sample concentrations. Surrogates were within acceptance limits for other QC samples and blanks analyzed for PCBs.

Matrix Spike / Matrix Spike Duplicate Analyses

Data for matrix spike / matrix spike duplicates were evaluated to determine laboratory precision and method bias for specific sample matrices.

The laboratory performed a PCB matrix spike / matrix spike duplicate (MS/MSD) analyses on LEA soil sample 2002385. Aroclor 1254 was spiked into the MS and MSD samples. Percent recovery was within acceptance limits, however, relative percent difference was outside the acceptance limits (57.7%). All affected data were qualified as Estimated (J) in the unspiked sample.

Laboratory Control Sample

Laboratory control samples are evaluated to assess the internal quality control of the laboratory's analytical method accuracy and method bias.

All QC acceptance criteria were met for percent recovery (%R) for the LCS sample.

Field Duplicate

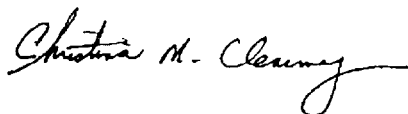
A field duplicate pair was not submitted with this data set.

OVERALL EVALUATION OF THE DATA

The objective of the final evaluation of this data package is to identify the “analytical error” and any “sampling error” associated with the data. The sum of the “analytical error” and the “sampling error” equals the “measurement error.” The end user should use the “measurement error” in conjunction with sampling variability to determine “total error” (total uncertainty) associated with the data. Ultimately, the end user should assess data usability in the context of the pre-determined Data Quality Objectives (DQOs) and resultant “total error” of the data.

Aroclor 1254 was estimated for sample 2002385 due to poor MS/MSD RPD. It should be noted that surrogates could not be evaluated in sample 2002388 due to elevated sample concentrations.

To the best of my knowledge, after thorough review of the attached sampling data and validation information, I believe that the data does show that the Performance Standards identified in the Remedial Action Work Plan have been met.

A handwritten signature in black ink, appearing to read "Christina M. Cleary". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

Authorized Pratt & Whitney Representative



Loureiro Engineering Associates, Inc.

To: Brian Cutler / LEA
From: Tina Clemmey / LEA
DV Report Date: 05/02/02

Project Name: Willow Brook Pond PCB Remediation
Sampled Date: 04/17/02

A Tier II data validation was performed on data for eight soil samples collected on April 17, 2002 for the Willow Brook Willow Pond PCB Remediation Project at Pratt & Whitney in East Hartford, Connecticut. A trip blank (2002396) was included with the sample delivery group. The samples discussed in this validation memorandum were analyzed for VOCs by SW846 Method 8260B, SVOCs by SW846 Method 8270C, TPH by USEPA 418.1, Metals by SW846 Method 6010B and Cyanide by SW846 Method 9012. These parameters are herein referred to as the "other parameters." Validation for the samples submitted for PCBs by SW846 Method 8082 are presented in a separate validation report.

The samples were submitted to Premier Laboratory, LLC in Brooklyn, CT. Premier processed and reported these samples under Project 88UT103. The internal laboratory lot number associated with this sample delivery group is E204704.

The sample results were assessed according to Region 1, EPA Data Validation Functional Guidelines for Evaluating Environmental Analyses: Organic Data Review (December 1996), Pesticides / PCBs Data Review (July 1988) and Inorganic Data Review (February 1989) as appropriate. Chemistry parameters were validated using the same logic as presented in Region 1, EPA validation guidelines for other parameters where applicable. Since there is no official guidance at this time for

validating general chemistry analyses. Technical judgement was applied when applicable and necessary.

The following tables have been included in this report: Table I: Summary of Tier II Data Assessment, Table II Samples associated with the sample delivery group (SDG), Table III: Summary of Data Validation Qualifiers applied to samples as a result of the validation, and Table IV: Summary of Qualified Analytical Results.

An explanation of the validation decisions is presented below.

SAMPLES

Samples included in this review are listed in Table II of this report.

ORGANIC DATA REVIEW

Organic data review includes review of analyses for volatile organic compounds (VOCs) and semivolatile organic compounds (SVOCs).

REVIEW OF ELEMENTS

Sample data were reviewed for the following parameters:

- | | |
|--------------------------------------|---|
| ▪ Performance Evaluation Sample Data | ▪ Surrogate Compounds |
| ▪ Agreement with Chain-of-Custody | ▪ Internal Standards |
| ▪ Preservation and Holding Time | ▪ Matrix Spike / Matrix Spike Duplicate |
| ▪ GC/MS Instrument Performance Check | ▪ Laboratory Control Sample |

- Initial and Continuing Calibration
- Practical Quantitation Limits
- Blanks
- Tentatively Identified compounds

DISCUSSION

Agreement of Analyses with Chain of Custody

Sample reports are checked to verify that the reported results corresponded to analytical requests as detailed on the chain-of-custody record. The chain-of-custody form is reviewed for accuracy and completeness.

Samples were relinquished to Premier Laboratory, LLC under chain-of-custody on April 17, 2002. The laboratory received the samples April 17, 2002. During validation, the chain-of-custody form was reviewed for accuracy and completeness. No discrepancies were noted.

VOLATILE ORGANIC ANALYSES

Performance Evaluation Data

Data for performance evaluation samples (PEs) are generated to provide information on the overall accuracy and bias of the analytical method and on laboratory performance. The PE is evaluated to assess the magnitude and direction of the quantitative bias.

A performance evaluation sample was not submitted with this data set. PEs are submitted at a frequency of one per 20 samples and are tracked on an on-going basis.

Preservation and technical holding times

The validity of the analytical results is evaluated based on the preservation techniques used and the holding time of the sample, as appropriate.

The sample cooler temperature recorded by the laboratory was 14.0°C. The QC acceptance limit for sample temperature is 2°C – 6°C. Samples were not qualified based on sample temperature since the time from sample collection to transport to receipt at the laboratory is very short. All samples were placed on ice and in addition, all VOC soil samples were preserved on site in methanol according to SW846 Method 5035. All samples were extracted and analyzed within method specified holding times.

GC/MS Instrument Performance Check

Gas chromatograph / mass spectrometer (GC/MS) instrument performance (tuning) checks are evaluated to ensure proper mass calibration and resolution, identification and to some degree sensitivity.

All ion abundance acceptance criteria specified in the methods for VOCs were met for each 12-hour period that samples were analyzed.

Initial and Continuing Calibration

Compliance requirements for initial and continuing calibrations are evaluated to ensure that the instruments are capable of producing acceptable qualitative and quantitative data.

All VOC target compounds were within the QC acceptance criteria for the initial and continuing calibrations.

Blanks

Blank analyses data is to determine the existence and magnitude of contamination problems resulting from laboratory and / or field activities and to subsequently assess their contribution to measurement error

A trip blank (2002396) and the method blank were evaluated for contamination for VOCs. No detects were reported.

Surrogate Compounds

Sample matrix effects and laboratory performance on individual samples are assessed by evaluating surrogate recovery. Poor surrogate recovery can be an indication of Interfering matrix effects, presence of high concentration target and/or non-target analytes, and poor laboratory performance.

QC acceptance criteria was met for percent recovery (%R) for surrogates in all of the field samples, QC samples and blanks analyzed for VOCs. No qualifications were made on the unspiked sample.

Internal Standards

Instrument performance, stability and laboratory precision are evaluated by assessing internal standard area count recovery and retention time drift.

All VOC data for the QC acceptance criteria were met for internal standard (IS) area counts and retention times.

Matrix Spike / Matrix Spike Duplicate Analyses

Data for matrix spike / matrix spike duplicates were evaluated to determine laboratory precision and method bias for specific sample matrices.

The laboratory performed a VOC matrix spike / matrix spike duplicate (MS/MSD) analyses on LEA soil sample 2002385. All data were within acceptance limits for % recovery (%R) and Relative Percent Difference (RPD) for the MS and MSD analyses.

Laboratory Control Sample

Laboratory control samples are evaluated to assess the internal quality control of the laboratory's analytical method accuracy and method bias.

All data met the QC acceptance criteria for percent recovery for the VOC laboratory control sample(s).

Field Duplicate

A field duplicate pair was not submitted with this data set.

Tentatively Identified Compounds

No tentatively identified compounds were reported.

SEMIVOLATILE ORGANIC ANALYSES

Performance Evaluation Data

Data for performance evaluation samples (PEs) are generated to provide information on the overall accuracy and bias of the analytical method and on laboratory performance. The PE is evaluated to assess the magnitude and direction of the quantitative bias.

A performance evaluation sample was not submitted with this data set. PEs are submitted at a frequency of one per 20 samples and are tracked on an on-going basis.

Preservation and technical holding times

The validity of the analytical results is evaluated based on the preservation techniques used and the holding time of the sample, as appropriate.

The sample cooler temperature recorded by the laboratory was 14.0°C. The QC acceptance limit for sample temperature is 2°C – 6°C. Samples were not qualified based on sample temperature since the time from sample collection to transport to receipt at the laboratory is very short. All samples were extracted and analyzed within method specified holding times.

GC/MS Instrument Performance Check

Gas chromatograph / mass spectrometer (GC/MS) instrument performance (tuning) checks are evaluated to ensure proper mass calibration and resolution, identification and to some degree sensitivity.

All ion abundance acceptance criteria specified in the methods SVOCs were met for each 12-hour period that samples were analyzed.

Initial and Continuing Calibration

Compliance requirements for initial and continuing calibrations are evaluated to ensure that the instruments are capable of producing acceptable qualitative and quantitative data.

All SVOC target compounds were within the QC acceptance criteria for the initial and continuing calibrations.

Blanks

Blank analyses data is to determine the existence and magnitude of contamination problems resulting from laboratory and / or field activities and to subsequently assess their contribution to measurement error

The method blank was evaluated for contamination for SVOCs. No detects were reported.

Surrogate Compounds

Sample matrix effects and laboratory performance on individual samples are assessed by evaluating surrogate recovery. Poor surrogate recovery can be an indication of Interfering matrix effects, presence of high concentration target and/or non-target analytes, and poor laboratory performance.

QC acceptance criteria was met for percent recovery (%R) for surrogates in all of the field samples, QC samples and blanks analyzed for SVOCs.

Internal Standards

Instrument performance, stability and laboratory precision are evaluated by assessing internal standard area count recovery and retention time drift.

All SVOC data for the QC acceptance criteria were met for internal standard (IS) area counts and retention times.

Matrix Spike / Matrix Spike Duplicate Analyses

Data for matrix spike / matrix spike duplicates were evaluated to determine laboratory precision and method bias for specific sample matrices.

The laboratory performed an SVOC matrix spike / matrix spike duplicate (MS/MSD) analyses on LEA soil sample 2002385. Many SVOC compounds were outside the MS/SMSD percentage R QC limits, and all of the SVOC compounds were outside the MS/MSD RPD QC acceptance limits. Results in the unspiked sample were qualified accordingly. Refer to attached validation tables for details of qualification decisions.

Laboratory Control Sample

Laboratory control samples are evaluated to assess the internal quality control of the laboratory's analytical method accuracy and method bias.

All data met the QC acceptance criteria for percent recovery for the SVOC laboratory control samples.

Field Duplicate

A field duplicate pair was not submitted with this data set.

Tentatively Identified Compounds

No tentatively identified compounds were reported.

INORGANIC DATA REVIEW

REVIEW OF ELEMENTS

Sample data were reviewed for the following parameters:

- | | |
|--|-------------------------------------|
| ▪ Performance Evaluation Data | ▪ Matrix Spike |
| ▪ Agreement with Chain of Custody | ▪ Field Duplicates |
| ▪ Preservation and Technical Holding Times | ▪ Laboratory Duplicates |
| | ▪ Furnace AA / Post Digestion Spike |
| ▪ Calibration Verification | ▪ Laboratory Control Sample |
| ▪ Blanks | ▪ Serial Dilution Results |
| ▪ ICP Interference Check Sample | ▪ Detection Limit Results |

DISCUSSION

Performance Evaluation Data

Data for performance evaluation samples (PEs) are generated to provide information on the overall accuracy and bias of the analytical method and on laboratory performance. The PE is evaluated to assess the magnitude and direction of the quantitative bias.

A performance evaluation sample was not submitted with this data set. PEs are submitted at a frequency of one per 20 samples and are tracked on an on-going basis.

Preservation and Holding Times

All samples were properly preserved and analyzed within method-specified holding times.

Calibration Verification

Compliance requirements are evaluated to ensure that the instrument is capable of producing acceptable quantitative data.

All initial calibration verification (ICV) and continuing calibration verification (CCV) for all metals were analyzed at the appropriate frequency and were within control limits

Lab Fortified Blanks

Blank analyses were assessed to determine the existence and magnitude of contamination problems.

All analytes were within acceptance limit for percent recovery for the lab fortified

blank analyses.

Matrix Spike / Matrix Spike Duplicate

The matrix spike sample was evaluated to provide information about the effect of the sample matrix on the digestion and measurement methodology.

A MS/MSD was performed on sample 2002385. All analytes were within acceptance limits for % recovery (%R) and Relative Percent Difference (RPD) for the MS and MSD analyses.

Laboratory Duplicates

All analytes were within acceptance limits for Relative Percent Difference for the laboratory duplicate analyses. Criteria for acceptable duplicate precision is less than 35% RPD for sample results that are greater than five times the CRDL and +/- 2X CRDL for sample results that are less than the five times the CRDL.

Field Duplicates

Field duplicates were assessed to determine overall precision (i.e. field and laboratory precision).

A field duplicate pair was not submitted with this data set.

Laboratory Control Sample

The laboratory control sample is evaluated to assess the efficiency of the digestion procedure.

All data were within the QC acceptance criteria for LCS percent recovery (%R), with the exception of Arsenic and Lead, which were outside the QC acceptance limits (bias

low). All affected data were qualified accordingly.

ICP Interference Check Sample

All results were within QC acceptance limits for % recovery for the ICP Interference Check sample.

GENERAL CHEMISTRY DATA REVIEW

General Chemistry data review includes review of analyses for Total Petroleum Hydrocarbons (TPH) and Cyanide. There are currently no Region 1 functional guidelines for data validation of general chemistry parameters. Therefore, general chemistry data are evaluated based upon the QC requirements specified in the method by which they were analyzed.

REVIEW OF ELEMENTS

Sample data were reviewed for the following parameters:

- | | |
|---------------------------------------|-----------------------------|
| ▪ Performance Evaluation Sample Data | ▪ Matrix Spike |
| ▪ Agreement with Chain of Custody | ▪ Field Duplicates |
| ▪ Preservation and Holding Time | ▪ Laboratory Duplicates |
| ▪ Initial Calibration Verification | ▪ Laboratory Control Sample |
| ▪ Continuing Calibration Verification | ▪ Detection Limit Results |
| ▪ Blanks | |

DISCUSSION

Performance Evaluation Data

Data for performance evaluation samples (PEs) are generated to provide information on the overall accuracy and bias of the analytical method and on laboratory performance. The PE is evaluated to assess the magnitude and direction of the quantitative bias.

A performance evaluation sample was not submitted with this data set. PEs are submitted at a frequency of one per 20 samples and are tracked on an on-going basis.

Preservation and Holding Times

All samples analyzed for TPH and cyanide were extracted within method-specified holding times.

Initial Calibration Verification

The initial calibrations were analyzed at the appropriate frequency. The correlation coefficient for the initial calibration curve for TPH was greater than 0.9950. The %RSD was less than 20%. All initial calibration QC acceptance criteria were met for Cyanide.

Continuing Calibration Verification

The continuing calibrations were analyzed at the appropriate frequency. The %D was below 15% for the continuing calibration analyses for TPH. All QC acceptance criteria were met for continuing calibrations for cyanide.

Blanks

No detects were reported in the associated method blanks for TPH and cyanide. All QC acceptance criteria for the blanks were acceptable

Matrix Spike

The MS / MSD was performed on sample 2002385. All data were within QC acceptance limits for TPH and cyanide.

Field Duplicate

A field duplicate pair was not submitted with this data set.

Laboratory Duplicate

Laboratory precision was demonstrated through laboratory duplicate analysis. All sample duplicate results were within QC acceptance limits for duplicate RPD.

Laboratory Control Sample

All QC acceptance criteria were met for LCS for TPH and cyanide.

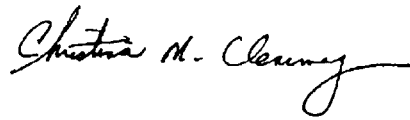
OVERALL EVALUATION OF THE DATA

The objective of the final evaluation of this data package is to identify the “analytical error” and any “sampling error” associated with the data. The sum of the “analytical error” and the “sampling error” equals the “measurement error.” The end user should use the “measurement error” in conjunction with sampling variability to determine “total error” (total uncertainty) associated with the data. The data in this data package have been qualified as rejected (R) or estimated (J) depending upon the degree of analytical and / or sampling error. Ultimately, the end user should assess data usability in the context of the pre-determined Data Quality Objectives (DQOs) and resultant “total error” of the data.

Some SVOC data were qualified based on high RPD / low %R in the MS/MSD. Arsenic and Lead were qualified as Estimated due to low LCS results.

To the best of my knowledge, after thorough review of the attached sampling data and

validation information, I believe that the data does show that the Performance Standards identified in Remedial Action Work Plan have been met.

A handwritten signature in black ink, reading "Christina M. Cleary". The signature is written in a cursive style with a long, sweeping underline.

Authorized Pratt & Whitney Representative



Loureiro Engineering Associates, Inc.

To: Brian Cutler / LEA
From: Tina Clemmey / LEA
DV Report Date: 03/14/02

Project Name: Willow Brook Pond PCB Remediation
Sampled Date: 03/12/02

A Tier II data validation was performed on data for three concrete chip samples collected on March 12, 2002 for the Willow Brook Willow Pond PCB Remediation Project at Pratt & Whitney in East Hartford, Connecticut. The samples were collected from locations of the Site designated as WT-CS-11-076 through WT-CS-11-078. All samples were analyzed for PCBs by USEPA SW846 Method 8082.

The samples were submitted to Premier Laboratory, LLC in Brooklyn, CT. Premier processed and reported these samples under Project 88UT002-103. The internal laboratory lot number associated with this sample delivery group is E203451 (batch 13947).

The sample results were assessed according to Region 1, EPA Data Validation Functional Guidelines for Evaluating Environmental Analyses: Pesticides / PCBs, July 1988. Additional guidance and logic was obtained from the Functional Guidelines for Volatile / Semivolatile Data Validation Functional Guidelines, December 1996 when applicable. Technical judgement was also applied where applicable

The following tables have been included in this report: Table 1: Tier II Data

Assessment, Table 2: Samples associated with the sample delivery group (SDG), Table 3: Summary of Data Validation Qualifiers applied to samples as a result of the validation, Table 4: Summary of Qualified Analytical Results.

An explanation of the validation decisions is presented below.

SAMPLES

Samples included in this review are listed in Table 2 of this report.

PCB ANALYSES

Performance Evaluation Data

Data for performance evaluation samples (PEs) are generated to provide information on the overall accuracy and bias of the analytical method and on laboratory performance. The PE is evaluated to assess the magnitude and direction of the quantitative bias. The frequency for performance evaluation samples for this project is one per twenty field samples.

A double blind aqueous performance evaluation sample was not submitted with this data set.

Preservation and technical holding times

The validity of the analytical results is evaluated based on the preservation techniques used and the holding time of the sample, as appropriate.

The samples were extracted and analyzed within acceptable holding time. The sample temperature upon receipt was 9.0°C, which was not within the acceptance limit of 4°C +/- 2°C. No qualification was applied based on sample temperature due to the logistics of the sample transport process. Samples were collected at ambient temperature, placed in a cooler on ice and immediately transferred to the courier. The

trip from the Site to the laboratory is generally completed in approximately one hour.

Agreement with the Chain of Custody

Samples were shipped to Premier Laboratory under chain of custody on 03/12/02. The laboratory received the samples on 03/12/02. The samples were analyzed for PCBs by SW846 Method 8082. Validation of PCBs is discussed in this report. No discrepancies were noted.

Initial Calibration and Continuing Calibration

Compliance requirements for initial and continuing calibrations are evaluated to ensure that the instruments are capable of producing acceptable qualitative and quantitative data.

Initial calibration curves were performed on GC4. Equal concentrations of a mixture of Aroclors 1016 and 1260 were used. Calibration factors were calculated at five concentrations. All percent relative standard deviations (%RSD) were less than 20%.

Continuing calibration verifications were performed on GC4. Each continuing calibration standard consisted of a mixture of Aroclors 1016 and 1260 and was performed at a single concentration. The percent drift (%D) was less than 15%. QC acceptance criteria were met for the continuing calibration.

Blanks

Blank analyses data is to determine the existence and magnitude of contamination problems resulting from laboratory and / or field activities and to subsequently assess their contribution to measurement error

No detects were reported in the method blank.

Surrogate Compounds

Sample matrix effects and laboratory performance on individual samples are

assessed by evaluating surrogate recovery. Poor surrogate recovery can be an indication of Interfering matrix effects, presence of high concentration target and/or non-target analytes, and poor laboratory performance.

Surrogates tetrachloro-m-xylene and decachlorobiphenyl were spiked into every sample. QC acceptance criteria was met for percent recovery (%R) for both surrogates in all of the field samples, QC samples and blanks analyzed for PCBs.

Matrix Spike / Matrix Spike Duplicate Analyses

Data for matrix spike / matrix spike duplicates were evaluated to determine laboratory precision and method bias for specific sample matrices.

A matrix spike analysis was not performed on any of the concrete chip samples in this SDG.

Laboratory Control Sample

Laboratory control samples are evaluated to assess the internal quality control of the laboratory's analytical method accuracy and method bias.

All QC acceptance criteria were met for percent recovery (%R) for the LCS samples.

Field Duplicate

A field duplicate pair was not submitted with this data set.

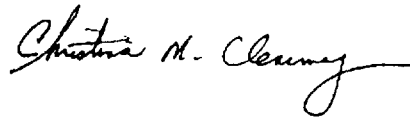
OVERALL EVALUATION OF THE DATA

The objective of the final evaluation of this data package is to identify the “analytical error” and any “sampling error” associated with the data. The sum of the “analytical error” and the “sampling error” equals the “measurement error.” The end user should

use the “measurement error” in conjunction with sampling variability to determine “total error” (total uncertainty) associated with the data. Ultimately, the end user should assess data usability in the context of the pre-determined Data Quality Objectives (DQOs) and resultant “total error” of the data.

No data qualified.

To the best of my knowledge, after thorough review of the attached sampling data and validation information, I believe that the data does show that the Performance Standards identified in the Remedial Action Work Plan have been met.

A handwritten signature in black ink, reading "Christina M. Cleary". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

Authorized Pratt & Whitney Representative



Loureiro Engineering Associates, Inc.

To: Brian Cutler / LEA
From: Tina Clemmey / LEA
DV Report Date: 02/25/02

Project Name: Willow Brook Pond PCB Remediation
Sampled Date: 02/21/02

A Tier II data validation was performed on data for eight wipe samples collected on February 21, 2002 for the Willow Brook Willow Pond PCB Remediation Project at Pratt & Whitney in East Hartford, Connecticut. The samples were collected from locations of the Site designated as WT-CS-11-068 through WT-CS-11-075. All samples were analyzed for PCBs by USEPA SW846 Method 8082.

The samples were submitted to Premier Laboratory, LLC in Brooklyn, CT. Premier processed and reported these samples under Project 88UT002-103. The internal laboratory lot number associated with this sample delivery group is E202769 (batch 13536).

The sample results were assessed according to Region 1, EPA Data Validation Functional Guidelines for Evaluating Environmental Analyses: Pesticides / PCBs, July 1988. Additional guidance and logic was obtained from the Functional Guidelines for Volatile / Semivolatile Data Validation Functional Guidelines, December 1996 when applicable. Technical judgement was also applied where applicable

The following tables have been included in this report: Table 1: Tier II Data

Assessment, Table 2: Samples associated with the sample delivery group (SDG), Table 3: Summary of Data Validation Qualifiers applied to samples as a result of the validation, Table 4: Summary of Qualified Analytical Results.

An explanation of the validation decisions is presented below.

SAMPLES

Samples included in this review are listed in Table 2 of this report.

PCB ANALYSES

Performance Evaluation Data

Data for performance evaluation samples (PEs) are generated to provide information on the overall accuracy and bias of the analytical method and on laboratory performance. The PE is evaluated to assess the magnitude and direction of the quantitative bias. The frequency for performance evaluation samples for this project is one per twenty field samples.

A double blind aqueous performance evaluation sample was not submitted with this data set.

Preservation and technical holding times

The validity of the analytical results is evaluated based on the preservation techniques used and the holding time of the sample, as appropriate.

The samples were extracted and analyzed within acceptable holding time. The sample temperature upon receipt was 7.0°C, which was not technically within the acceptance limit of 4°C +/- 2°C. No qualification was applied based on sample temperature due to the logistics of the sample transport process. Samples were collected at ambient temperature, placed in a cooler on ice and immediately transferred to the courier. The

trip from the Site to the laboratory is generally completed in approximately one hour.

Agreement with the Chain of Custody

Eight samples were shipped to Premier Laboratory under chain of custody on 02/21/02. The samples were analyzed for PCBs by SW846 Method 8082. Validation of PCBs is discussed in this report. No discrepancies were noted.

Initial Calibration and Continuing Calibration

Compliance requirements for initial and continuing calibrations are evaluated to ensure that the instruments are capable of producing acceptable qualitative and quantitative data.

Initial calibration curves were performed on GC8. Equal concentrations of a mixture of Aroclors 1016 and 1260 were used. Calibration factors were calculated at five concentrations. All percent relative standard deviations (%RSD) were less than 20%.

Continuing calibration verifications were performed on GC8. Each continuing calibration standard consisted of a mixture of Aroclors 1016 and 1260 and was performed at a single concentration. The percent drift (%D) was less than 15%. QC acceptance criteria were met for the continuing calibration.

Blanks

Blank analyses data is to determine the existence and magnitude of contamination problems resulting from laboratory and / or field activities and to subsequently assess their contribution to measurement error

No detects were reported in the method blank.

Surrogate Compounds

Sample matrix effects and laboratory performance on individual samples are assessed by evaluating surrogate recovery. Poor surrogate recovery can be

an indication of Interfering matrix effects, presence of high concentration target and/or non-target analytes, and poor laboratory performance.

Surrogates tetrachloro-m-xylene and decachlorobiphenyl were spiked into every sample. QC acceptance criteria was met for percent recovery (%R) for both surrogates in all of the field samples, QC samples and blanks analyzed for PCBs.

Matrix Spike / Matrix Spike Duplicate Analyses

Data for matrix spike / matrix spike duplicates were evaluated to determine laboratory precision and method bias for specific sample matrices.

The laboratory did not perform a PCB matrix spike / matrix spike duplicate (MS/MSD) analyses for wipe samples.

Laboratory Control Sample

Laboratory control samples are evaluated to assess the internal quality control of the laboratory's analytical method accuracy and method bias.

All QC acceptance criteria were met for percent recovery (%R) for the LCS samples.

Field Duplicate

A field duplicate pair was not submitted with this data set. Field duplicates are submitted at a frequency of one per twenty samples and are assessed on an on-going basis.

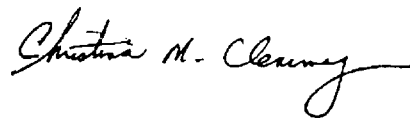
OVERALL EVALUATION OF THE DATA

The objective of the final evaluation of this data package is to identify the “analytical error” and any “sampling error” associated with the data. The sum of the “analytical

error” and the “sampling error” equals the “measurement error.” The end user should use the “measurement error” in conjunction with sampling variability to determine “total error” (total uncertainty) associated with the data. Ultimately, the end user should assess data usability in the context of the pre-determined Data Quality Objectives (DQOs) and resultant “total error” of the data.

No data qualified.

To the best of my knowledge, after thorough review of the attached sampling data and validation information, I believe that the data does show that the Performance Standards identified in the Remedial Action Work Plan have been met.

A handwritten signature in black ink, reading "Christina M. Cleary". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

Authorized Pratt & Whitney Representative



Loureiro Engineering Associates, Inc.

To: Brian Cutler / LEA
From: Tina Clemmey / LEA
DV Report Date: 02/11/02

Project Name: Willow Brook Pond PCB Remediation
Sampled Date: 02/07/02

A Tier II data validation was performed on data for eight soil samples collected on February 7, 2002 for the Willow Brook Willow Pond PCB Remediation Project at Pratt & Whitney in East Hartford, Connecticut. The samples were collected from locations of the Site designated as WT-CS-10-009 through WT-CS-10-015 and WT-CS-13-018. All samples were analyzed for PCBs by USEPA SW846 Method 8082.

The samples were submitted to Premier Laboratory, LLC in Brooklyn, CT. Premier processed and reported these samples under Project 88UT002-103. The internal laboratory lot number associated with this sample delivery group is E202232 (batch 13256).

The sample results were assessed according to Region 1, EPA Data Validation Functional Guidelines for Evaluating Environmental Analyses: Pesticides / PCBs, July 1988. Additional guidance and logic was obtained from the Functional Guidelines for Volatile / Semivolatile Data Validation Functional Guidelines, December 1996 when applicable. Technical judgement was also applied where applicable

The following tables have been included in this report: Table 1: Tier II Data

Assessment, Table 2: Samples associated with the sample delivery group (SDG), Table 3: Summary of Data Validation Qualifiers applied to samples as a result of the validation, Table 4: Summary of Qualified Analytical Results.

An explanation of the validation decisions is presented below.

SAMPLES

Samples included in this review are listed in Table 2 of this report.

PCB ANALYSES

Performance Evaluation Data

Data for performance evaluation samples (PEs) are generated to provide information on the overall accuracy and bias of the analytical method and on laboratory performance. The PE is evaluated to assess the magnitude and direction of the quantitative bias. The frequency for performance evaluation samples for this project is one per twenty field samples.

A double blind aqueous performance evaluation sample (2001844) was submitted with this data set. The PE sample was prepared by Environmental Resource Associates (ERA). The ERA lot number associated with this sample was 0204-02-11.7. Aroclor 1254 was spiked into the sample at a concentration of 7.22 ug/l. The performance acceptance limit was 3.70-9.53 ug/l. The laboratory reported a concentration of 6.6 ug/l. QC acceptance criteria were met. Performance data is presented in Attachment 1 of this report.

Preservation and technical holding times

The validity of the analytical results is evaluated based on the preservation techniques used and the holding time of the sample, as appropriate.

The samples were extracted and analyzed within acceptable holding time. The sample temperature upon receipt was 8.0°C, which was not within the acceptance limit of 4°C +/- 2°C. No qualification was applied based on sample temperature due to the logistics of the sample transport process. Samples were collected at ambient temperature, placed in a cooler on ice and immediately transferred to the courier. The trip from the Site to the laboratory is generally completed in approximately one hour.

Agreement with the Chain of Custody

Ten samples were shipped to Premier Laboratory under chain of custody on 02/07/02. All of the samples were analyzed for PCBs by SW846 Method 8082. Validation of PCBs is discussed in this report. No discrepancies were noted.

Initial Calibration and Continuing Calibration

Compliance requirements for initial and continuing calibrations are evaluated to ensure that the instruments are capable of producing acceptable qualitative and quantitative data.

Initial calibration curves were performed on GC4. Equal concentrations of a mixture of Aroclors 1016 and 1260 were used. Calibration factors were calculated at five concentrations. All percent relative standard deviations (%RSD) were less than 20%.

Continuing calibration verifications were performed on GC 4. Each continuing calibration standard consisted of a mixture of Aroclors 1016 and 1260 and was performed at a single concentration. The percent drift (%D) was less than 15%. QC acceptance criteria were met for the continuing calibration.

Blanks

Blank analyses data is to determine the existence and magnitude of contamination problems resulting from laboratory and / or field activities and to subsequently assess their contribution to measurement error

No detects were reported in the method blank.

Surrogate Compounds

Sample matrix effects and laboratory performance on individual samples are assessed by evaluating surrogate recovery. Poor surrogate recovery can be an indication of Interfering matrix effects, presence of high concentration target and/or non-target analytes, and poor laboratory performance.

Surrogates tetrachloro-m-xylene and decachlorobiphenyl were spiked into every sample. QC acceptance criteria was met for percent recovery (%R) for both surrogates in all of the field samples, QC samples and blanks analyzed for PCBs. Surrogates were diluted out of sample 2001841 because the sample was analyzed at a 70X dilution due to elevated concentrations of Aroclor 1248 (76000 ug/kg), Aroclor 1254 (110000 ug/kg) and Aroclor 1260 (60000 ug/kg).

Matrix Spike / Matrix Spike Duplicate Analyses

Data for matrix spike / matrix spike duplicates were evaluated to determine laboratory precision and method bias for specific sample matrices.

The laboratory performed a PCB matrix spike / matrix spike duplicate (MS/MSD) analyses on LEA soil sample 2001836. Aroclor 1254 was spiked into the MS and MSD samples. Percent recovery and relative percent difference were within acceptance limits. All data were accepted as reported in the unspiked sample.

Laboratory Control Sample

Laboratory control samples are evaluated to assess the internal quality control of the laboratory's analytical method accuracy and method bias.

All QC acceptance criteria were met for percent recovery (%R) for the LCS samples.

Field Duplicate

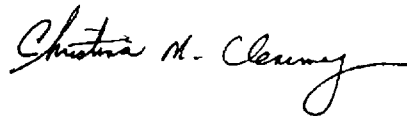
A field duplicate pair was not submitted with this data set.

OVERALL EVALUATION OF THE DATA

The objective of the final evaluation of this data package is to identify the “analytical error” and any “sampling error” associated with the data. The sum of the “analytical error” and the “sampling error” equals the “measurement error.” The end user should use the “measurement error” in conjunction with sampling variability to determine “total error” (total uncertainty) associated with the data. Ultimately, the end user should assess data usability in the context of the pre-determined Data Quality Objectives (DQOs) and resultant “total error” of the data.

No data qualified.

To the best of my knowledge, after thorough review of the attached sampling data and validation information, I believe that the data does show that the Performance Standards identified in the Remedial Action Work Plan have been met.

A handwritten signature in black ink, reading "Christina M. Cleary". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

Authorized Pratt & Whitney Representative



Loureiro Engineering Associates, Inc.

To: Brian Cutler / LEA
From: Tina Clemmey / LEA
DV Report Date: 02/13/02

Project Name: Willow Brook Pond PCB Remediation
Sampled Date: 02/07/02

A Tier II data validation was performed on data for three soil samples collected on February 7, 2002 for the Willow Brook Willow Pond PCB Remediation Project at Pratt & Whitney in East Hartford, Connecticut. A trip blank was included with the sample delivery group. The samples discussed in this validation memorandum were analyzed for VOCs by SW846 Method 8260B, SVOCs by SW846 Method 8270C, TPH by USEPA 418.1, Metals by SW846 Method 6010B and Cyanide by SW846 Method 9012. These parameters are herein referred to as the "other parameters." Validation for the samples submitted for PCBs by SW846 Method 8082 are presented in a separate validation report.

The samples were submitted to Premier Laboratory, LLC in Brooklyn, CT. Premier processed and reported these samples under Project 88UT103. The internal laboratory lot number associated with this sample delivery group is E202232.

The sample results were assessed according to Region 1, EPA Data Validation Functional Guidelines for Evaluating Environmental Analyses: Organic Data Review (December 1996), Pesticides / PCBs Data Review (July 1988) and Inorganic Data Review (February 1989) as appropriate. Chemistry parameters were validated using the same logic as presented in Region 1, EPA validation guidelines for other parameters where applicable. Since there is no official guidance at this time for

validating general chemistry analyses. Technical judgement was applied when applicable and necessary.

The following tables have been included in this report: Table I: Summary of Tier II Data Assessment, Table II Samples associated with the sample delivery group (SDG), Table III: Summary of Data Validation Qualifiers applied to samples as a result of the validation, and Table IV: Summary of Qualified Analytical Results.

An explanation of the validation decisions is presented below.

SAMPLES

Samples included in this review are listed in Table II of this report.

ORGANIC DATA REVIEW

Organic data review includes review of analyses for volatile organic compounds (VOCs) and semivolatile organic compounds (SVOCs).

REVIEW OF ELEMENTS

Sample data were reviewed for the following parameters:

- | | |
|--------------------------------------|---|
| ▪ Performance Evaluation Sample Data | ▪ Surrogate Compounds |
| ▪ Agreement with Chain-of-Custody | ▪ Internal Standards |
| ▪ Preservation and Holding Time | ▪ Matrix Spike / Matrix Spike Duplicate |
| ▪ GC/MS Instrument Performance Check | ▪ Laboratory Control Sample |

- Initial and Continuing Calibration
- Practical Quantitation Limits
- Blanks
- Tentatively Identified compounds

DISCUSSION

Agreement of Analyses with Chain of Custody

Sample reports are checked to verify that the reported results corresponded to analytical requests as detailed on the chain-of-custody record. The chain-of-custody form is reviewed for accuracy and completeness.

Samples were relinquished to Premier Laboratory, LLC under chain-of-custody on February 7, 2002. The laboratory received the samples on February 7, 2002. During validation, the chain-of-custody form was reviewed for accuracy and completeness. No discrepancies were noted.

VOLATILE ORGANIC ANALYSES

Performance Evaluation Data

Data for performance evaluation samples (PEs) are generated to provide information on the overall accuracy and bias of the analytical method and on laboratory performance. The PE is evaluated to assess the magnitude and direction of the quantitative bias.

A performance evaluation sample was not submitted with this data set. PEs are submitted at a frequency of one per 20 samples and are tracked on an on-going basis.

Preservation and technical holding times

The validity of the analytical results is evaluated based on the preservation techniques used and the holding time of the sample, as appropriate.

The sample cooler temperatures recorded by the laboratory were 4.0°C, and 8.0°C.

The QC acceptance limit for sample temperature is 2°C – 6°C. Samples were not qualified based on sample temperature since the time from sample collection to transport to receipt at the laboratory is very short. All samples were placed on ice and in addition, all VOC soil samples were preserved on site in methanol according to SW846 Method 5035. All samples were extracted and analyzed within method specified holding times.

GC/MS Instrument Performance Check

Gas chromatograph / mass spectrometer (GC/MS) instrument performance (tuning) checks are evaluated to ensure proper mass calibration and resolution, identification and to some degree sensitivity.

All ion abundance acceptance criteria specified in the methods for VOCs were met for each 12-hour period that samples were analyzed.

Initial and Continuing Calibration

Compliance requirements for initial and continuing calibrations are evaluated to ensure that the instruments are capable of producing acceptable qualitative and quantitative data.

All VOC target compounds were within the QC acceptance criteria for the initial and continuing calibrations.

Blanks

Blank analyses data is to determine the existence and magnitude of contamination problems resulting from laboratory and / or field activities and to subsequently assess their contribution to measurement error

A trip blank (2001842) and all method blanks were evaluated for contamination for

VOCs. No detects were reported.

Surrogate Compounds

Sample matrix effects and laboratory performance on individual samples are assessed by evaluating surrogate recovery. Poor surrogate recovery can be an indication of Interfering matrix effects, presence of high concentration target and/or non-target analytes, and poor laboratory performance.

QC acceptance criteria was met for percent recovery (%R) for surrogates in all of the field samples, QC samples and blanks analyzed for VOCs.

Internal Standards

Instrument performance, stability and laboratory precision are evaluated by assessing internal standard area count recovery and retention time drift.

All VOC data for the QC acceptance criteria were met for internal standard (IS) area counts and retention times.

Matrix Spike / Matrix Spike Duplicate Analyses

Data for matrix spike / matrix spike duplicates were evaluated to determine laboratory precision and method bias for specific sample matrices.

The laboratory performed a VOC matrix spike / matrix spike duplicate (MS/MSD) analyses on LEA soil sample 2001836. The following table summarizes data, which did not meet QC acceptance criteria:

Compound	%Rec MS	%Rec MSD	QC limits	RPD	RPD limits	Positive detects	NDs	Bias	Affected Samples
Chloroethane	26	29	60-142			J	J	Low	2001836
1,1-Dichloroethene	47		63-118	49.1	28	J	J	Low	2001836

All affected data were qualified accordingly.

Laboratory Control Sample

Laboratory control samples are evaluated to assess the internal quality control of the laboratory's analytical method accuracy and method bias.

All data met the QC acceptance criteria for percent recovery for the VOC laboratory control sample(s).

Field Duplicate

A field duplicate pair was not submitted with this data set.

Tentatively Identified Compounds

No tentatively identified compounds were reported.

SEMIVOLATILE ORGANIC ANALYSES

Performance Evaluation Data

Data for performance evaluation samples (PEs) are generated to provide information on the overall accuracy and bias of the analytical method and on

laboratory performance. The PE is evaluated to assess the magnitude and direction of the quantitative bias.

A performance evaluation sample was not submitted with this data set. PEs are submitted at a frequency of one per 20 samples and are tracked on an on-going basis.

Preservation and technical holding times

The validity of the analytical results is evaluated based on the preservation techniques used and the holding time of the sample, as appropriate.

The sample cooler temperature recorded by the laboratory was 8.0°C. The QC acceptance limit for sample temperature is 2°C – 6°C. Samples were not qualified based on sample temperature since the time from sample collection to transport to receipt at the laboratory is very short. All samples were placed on ice according to SW846 Method 5035. All samples were extracted and analyzed within method specified holding times.

GC/MS Instrument Performance Check

Gas chromatograph / mass spectrometer (GC/MS) instrument performance (tuning) checks are evaluated to ensure proper mass calibration and resolution, identification and to some degree sensitivity.

All ion abundance acceptance criteria specified in the methods SVOCs were met for each 12-hour period that samples were analyzed.

Initial and Continuing Calibration

Compliance requirements for initial and continuing calibrations are evaluated to ensure that the instruments are capable of producing acceptable qualitative and quantitative data.

All SVOC target compounds were within the QC acceptance criteria for the initial and continuing calibrations, with the exception of Pyrene and Hexachlorocyclopentadiene, which were outside the continuing calibration acceptance criteria (32 %D, and 36 %D, respectively). All affected data were qualified accordingly.

Blanks

Blank analyses data is to determine the existence and magnitude of contamination problems resulting from laboratory and / or field activities and to subsequently assess their contribution to measurement error

All method blanks were evaluated for contamination for SVOCs. No detects were reported.

Surrogate Compounds

Sample matrix effects and laboratory performance on individual samples are assessed by evaluating surrogate recovery. Poor surrogate recovery can be an indication of Interfering matrix effects, presence of high concentration target and/or non-target analytes, and poor laboratory performance.

QC acceptance criteria was met for percent recovery (%R) for surrogates in all of the field samples, QC samples and blanks analyzed for SVOCs. Since sample 2001820 had only one surrogate outside the acceptance range, no qualification was necessary.

Internal Standards

Instrument performance, stability and laboratory precision are evaluated by assessing internal standard area count recovery and retention time drift.

All SVOC data for the QC acceptance criteria were met for internal standard (IS) area counts and retention times.

All compounds quantitated using Chrysene-d12 and Perylene-d12 were qualified.

Matrix Spike / Matrix Spike Duplicate Analyses

Data for matrix spike / matrix spike duplicates were evaluated to determine laboratory precision and method bias for specific sample matrices.

The laboratory performed an SVOC matrix spike / matrix spike duplicate (MS/MSD) analyses on LEA soil sample 2001836. All data met the QC acceptance criteria.

Laboratory Control Sample

Laboratory control samples are evaluated to assess the internal quality control of the laboratory's analytical method accuracy and method bias.

All data met the QC acceptance criteria for percent recovery for the SVOC laboratory control sample(s).

Field Duplicate

A field duplicate pair was not submitted with this data set.

Tentatively Identified Compounds

No tentatively identified compounds were reported.

INORGANIC DATA REVIEW

REVIEW OF ELEMENTS

Sample data were reviewed for the following parameters:

- Performance Evaluation Data
- Agreement with Chain of Custody
- Matrix Spike
- Field Duplicates

- Preservation and Technical Holding Times
- Calibration Verification
- Blanks
- ICP Interference Check Sample
- Laboratory Duplicates
- Furnace AA / Post Digestion Spike
- Laboratory Control Sample
- Serial Dilution Results
- Detection Limit Results

DISCUSSION

Performance Evaluation Data

Data for performance evaluation samples (PEs) are generated to provide information on the overall accuracy and bias of the analytical method and on laboratory performance. The PE is evaluated to assess the magnitude and direction of the quantitative bias.

A performance evaluation sample was not submitted with this data set. PEs are submitted at a frequency of one per 20 samples and are tracked on an on-going basis.

Preservation and Holding Times

All samples were properly preserved and analyzed within method-specified holding times.

Calibration Verification

Compliance requirements are evaluated to ensure that the instrument is capable of producing acceptable quantitative data.

All initial calibration verification (ICV) and continuing calibration verification (CCV) for all metals were analyzed at the appropriate frequency and were within control limits

Lab Fortified Blanks

Blank analyses were assessed to determine the existence and magnitude of contamination problems.

All analytes were within acceptance limit for percent recovery for the lab fortified blank analyses.

ICP Interference Check Sample

The ICP interference check sample is evaluated to verify the laboratory's interelement and background correction factors.

All data met the QC acceptance criteria.

Matrix Spike / Matrix Spike Duplicate

The matrix spike sample was evaluated to provide information about the effect of the sample matrix on the digestion and measurement methodology.

A MS/MSD was performed on sample 2001836. All analytes were within acceptance limits for % recovery (%R) and Relative Percent Difference (RPD) for the MS and MSD analyses. The following table summarizes MS/MSD data that did not meet acceptance criteria:

Analyte	MS %R	MSD %R	%R QC Range	Detects	Non-detects	Samples Affected
Zinc		74.6	75-125	J	UJ	All samples in data set
Mercury	281.3	281.1	75-125	J	A	All samples in data set

All affected data were qualified accordingly.

Laboratory Duplicates

All analytes were within acceptance limits for Relative Percent Difference for the laboratory duplicate analyses. Criteria for acceptable duplicate precision is less than 35% RPD for sample results that are greater than five times the CRDL and +/- 2X CRDL for sample results that are less than the five times the CRDL.

Field Duplicates

Field duplicates were assessed to determine overall precision (i.e. field and laboratory precision).

A field duplicate pair was not submitted with this data set.

Laboratory Control Sample

The laboratory control sample is evaluated to assess the efficiency of the digestion procedure.

The following table summarizes data that did not meet acceptance criteria for percent recovery (%R) criteria:

Analyte	%R	%R Range	Detects	Non-detects	Samples affected
Arsenic	46.7	80-120	J	UJ	All samples in data set.

All data were qualified accordingly.

GENERAL CHEMISTRY DATA REVIEW

General Chemistry data review includes review of analyses for Total Petroleum Hydrocarbons (TPH), and cyanide. There are currently no Region 1 functional guidelines for data validation of general chemistry parameters. Therefore, general chemistry data are evaluated based upon the QC requirements specified in the method by which they were analyzed.

REVIEW OF ELEMENTS

Sample data were reviewed for the following parameters:

- Performance Evaluation Sample Data
- Agreement with Chain of Custody
- Preservation and Holding Time
- Initial Calibration Verification
- Continuing Calibration Verification
- Blanks
- Matrix Spike
- Field Duplicates
- Laboratory Duplicates
- Laboratory Control Sample
- Detection Limit Results

DISCUSSION

Performance Evaluation Data

Data for performance evaluation samples (PEs) are generated to provide information on the overall accuracy and bias of the analytical method and on laboratory performance. The PE is evaluated to assess the magnitude and direction of the quantitative bias.

A performance evaluation sample was not submitted with this data set. PEs are submitted at a frequency of one per 20 samples and are tracked on an on-going basis.

Preservation and Holding Times

All samples analyzed for TPH and cyanide were extracted within method-specified holding times.

Initial Calibration Verification

The initial calibration was analyzed at the appropriate frequency. The correlation coefficient for the initial calibration curve was greater than 0.9950. All initial calibration QC acceptance criteria were met.

Continuing Calibration Verification

The continuing calibrations were analyzed at the appropriate frequency. The %Rs were within +/- 10% for all continuing calibration analyses. All QC acceptance criteria were met.

Blanks

No positive detects were reported in the associated method blanks. All QC acceptance criteria for the blanks were acceptable

Matrix Spike

A MS/MSD was performed on sample 2001836. All analytes were within acceptance limits for % recovery (%R) and Relative Percent Difference (RPD) for the MS and MSD analyses.

Field Duplicate

A field duplicate pair was not submitted with this data set.

Laboratory Duplicate

Laboratory precision was demonstrated through laboratory duplicate analysis. All sample duplicate results were within QC acceptance limits for duplicate RPD.

Laboratory Control Sample

All QC acceptance criteria were met for LCS for TPH and cyanide.

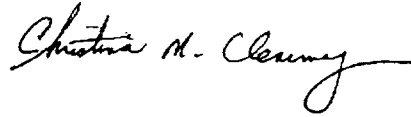
OVERALL EVALUATION OF THE DATA

The objective of the final evaluation of this data package is to identify the “analytical error” and any “sampling error” associated with the data. The sum of the “analytical error” and the “sampling error” equals the “measurement error.” The end user should use the “measurement error” in conjunction with sampling variability to determine “total error” (total uncertainty) associated with the data. The data in this data package have been qualified as rejected (R) or estimated (J) depending upon the degree of analytical and / or sampling error. Ultimately, the end user should assess data usability in the context of the pre-determined Data Quality Objectives (DQOs) and resultant “total error” of the data.

Chloroethane was estimated due to low MS/MSD % recovery. 1,1-Dichloroethene was estimated due to low % recovery / high RPD in the MS/MSD. Pyrene and Hexachlorocyclopentadiene were qualified as estimated due to high continuing calibration drift. Zinc and mercury were estimated due to low / high MS / MSD % recovery. Arsenic was estimated due to low LCS % recovery. A description of the

qualified sample results are outlined in Tables 3 and 4 specific to each parameter and are attached to this validation report.

To the best of my knowledge, after thorough review of the attached sampling data and validation information, I believe that the data does show that the Performance Standards identified in Remedial Action Work Plan have been met.

A handwritten signature in black ink, reading "Christina M. Cleary". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

Authorized Pratt & Whitney Representative